FREDERIC WOOD JONES.

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A CONCISE DESCRIPTION OF THE LOCALITY AND DISTRIBUTION OF THE ARTERIES IN THE HUMAN BODY.

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PREFACE.

IN presenting this Work to the Public, the Author's chief object is to afford to his Students the means of acquiring a most necessary and important branch of Anatomical science —a knowledge of the Locality of the Arteries.

To facilitate the acquirement of this essential information, a minute and precise description will be found of all the Arteries that are important in a surgical point of view, or that are to be traced in the common mode of dissecting injected subjects: this being an explanatory description of the "relative position" which every Artery, herein-described, bears to all the muscles and the other surrounding parts which it touches in its course.

The Author has perhaps been somewhat minute in describing the muscles and bones, &c., by which each Artery is covered, bounded or supported, because he knows that a thorough knowledge of the exact local relationship which these parts bear to each other, is the only clear and certain guide to the Anatomical Surgeon to find the true situation of the Arteries, or of arriving at a perfect knowledge of the relative position or local distribution, at each successive part of their course.

Some Anatomists, though they may describe exactly the length and the direction of each Artery, yet only, perhaps, describe its relative position with regard to some few muscles; or they speak of the relative muscular position in too general a way to convey any precise idea of its connection with the arterial; and in certain instances, indeed, they seem to have disregarded the muscular relationship altogether.

Although, I trust, that in this Work, the larger Arteries are described with tolerable care and precision, the minute branches, such as do not require a ligature upon bleeding, which are traced with difficulty even by a careful dissector, and which are always very variable in their origin and their course, if not absolutely uncertain as to their presence altogether, are intentionally slighted and frequently totally disregarded, except, indeed, those which have distinct inosculations; the place and formation of all the most important of these inosculations being accurately mentioned.

The Student, by relying too much upon written description, probably, gets bewildered, instead of enlightened, amongst a chaotic list of vessels, nerves and muscles; or can at best obtain but a very obscure view of the relative positions of the parts. Therefore, considering the many imperfections in books which treat of the relative positions, the Student would, in every practical point of view, gain but a very inefficient idea of Anatomy, and more especially, as regards that important branch of it, unless he seek his knowledge in the dissecting room by making ocular demonstration and practical dissection his grand sources of information, to which his study in the closet can only be secondary or subservient. Indeed, Anatomy, considered in the correct sense, is a collection of demonstrable facts: it is not a science of books, but a science of natural parts, in the acquirement of which, the eye must be the grand direction to the head.

It must be recollected, that this is only an anatomical outline of the Arterial System, without there being attached to it any physiological inference or surgical precept. It is, therefore, intended as the pupil's *first lines*, or the basis of his study of the Arteries upon a more extensive scale, by affording him an outline which may be filled up and rendered perfect in its more minute points of demonstration and description, forming a basis also on which facts useful and interesting both in Physiology and Surgery may be collected.

For these reasons I have recommenced the use of this book among my Pupils in their dissecting operations, in order to facilitate a knowledge of the Localities of the Arteries, and perhaps at a more advanced period of life, during their practical career, and in their operative days, (if I may so speak,) the perusal of this little tract may bring to their recollections many valuable facts which they had formerly heard, mingled with their demonstrations.

It is to be hoped, however, that if the writer's purpose be answered in so limited a sphere as his own class, this treatise may not be found altogether uninteresting or useless to anatomical students on a more general scale; and if it should be found useful, as he trusts it will, in leading on the student to anatomical knowledge, the Author's wishes will be amply gratified.

Great Pulteney Street, Golden Square.
October 1st, 1827.

AORTA.

The Aorta, which is the trunk of the corporeal system of Arteries, is divided into two primary portions :—viz., a part in the Thorax, called the Aorta Thoracica, and a part opposed to the Abdomen, called the Aorta Abdominalis. It arises from the posterior and right part of the left ventricle of the Heart, opposite to the fourth Dorsal Vertebra; its opening (containing the Semilunar Valves) being seen in the Ventricle, between the Septum Ventriculorum and the right portion of the Mitral Valve; it is more contracted in size here than any other part of the Aorta, and usually does not exceed an inch in diameter. It passes upwards behind the middle bone of the Sternum, bending a little forwards and towards the right side, bounded on the right side by the superior Vena Cava, and on the left by the Pulmonary Artery; being also so considerably enlarged as to have a bulging form, and to be called the Sinus Aorta;—it is also called the Aorta Ascendens. There are also three little bulges or hemispherical-shaped enlargements in the lowest part of the Sinus Aorta, called *Sinus Valsalvæ:* each of these are situated, respectively, above one of the Semilunar Valves; two are placed anteriorly and laterally, and the other posteriorly; and they are concealed (like the beginning of the Aorta at large) behind the commencement of the Pulmonary Artery. The upper part of the Sinus Aorta becoming a little diminished, and beginning to turn a little backwards, continues to ascend till it gets in a parallel line with the second Dorsal Vertebra; when it incurvates from before backwards, and from right to left, constituting the TRANSVERSE ARCH of the Aorta; but perhaps it may be more properly called the OBLIQUE ARCH of the Aorta: this is situated behind the lower part of the first bone of the Sternum, and extends *obliquely across* the upper part of the Thorax and posterior Mediastinum; the termination of the arch comes against the third Dorsal Vertebra; and then all the subsequent continuation of the Aorta is called the AORTA DESCENDENS: this passes downwards upon the left side of the bodies of the Dorsal Vertebræ, in the posterior and left part of the posterior Mediastinum, posteriorly to the base of the Heart, Pericardium, and left Pulmonary Ligament; it is next continued through the Foramen Posticum, Diaphragmatis; and upon emerging from behind the upper edge of that aperture, it is no longer *Thoracic*, but obtains the term of the AORTA ABDOMINALIS; i. e., the Abdominal portion of the Descending Aorta, so called because it is opposed to the Abdomen, or is one of those parts called extra-Abdominal; this descends upon the left side of the bodies of the lower Dorsal and the Lumbar Vertebræ, slightly inclining from left to right towards the medium line of the Vertebræ; descending behind the Margo Obtusus of the Liver, Pancreas, root of the Transverse Meso-colon, Transverse portion of the Duodenum, and root of the Mesentery; and being excluded for the whole of its course from the cavity of the Abdomen, inasmuch as it is behind the posterior side of the Peritoneal Sac. Upon the fourth Lumbar Vertebra, and having still hardly gained the median line of the bodies of the Vertebræ, but being still a little to the left side, it trifurcates into the two common Iliac Arteries, and the middle Sacral.

COMPARATIVE COURSE OF THE PULMONARY ARTERY.

The Pulmonary Artery, or the trunk of the Pulmonic System of Vessels, arises from the posterior and left side of the right Ventricle, anteriorly to the origin of the Sinus Aorta ; it slants upwards, backwards, and towards the left side, so as to get by the left side of the higher part of the Sinus Aorta ; and as it is immersed in the upper part of the Pericardium, and just beneath the arch of the Aorta, it bifurcates into the right and left Pulmonary Arteries ; the bifurcation of the trunk being connected by a process of condensed cellular membrane called the Ligamentum Arteriosum, with the posterior and under part of the arch of the Aorta, which ligament is the degenerated remains of the Ductus Arteri osus.

The Arteria Pulmonalis Dextra, which is longer and larger than the left, because the bifurcation of the Pulmonary Artery is more towards the left side than the right, and because the right lung is larger than the left,—bends downwards, and towards the right side, passing first behind the Sinus Aorta, and then behind the superior Vena Cava ; and as it emerges from the side of the Pericardium, becomes insinuated between the two laminæ of the Pleura forming the

Ligamentum Pulmonale Latum Dextrum, so as to perforate the root of the right lung, and to be distributed through its substance.

The ARTERIA PULMONALIS SINISTRA passes towards the left side, whilst it bends (like the right) rather downwards, so as to emerge completely from the embrace of the Pericardium, and to be continued outwards between the laminæ of the Ligamentum Pulmonale Latum Sinistrum, anteriorly to the commencement of the descending portion of the Thoracic Aorta; it then perforates the root of the left Lung, and is distributed through its substance.

THE ARTERIES OF THE SYSTEM, GIVEN OFF FROM THE AORTA.

BRANCHES FROM THE SINUS AORTA.

1. The ARTERIA CORONARIA DEXTRA arises from the fore and right side of the Sinus, from the Sinus Valsalvæ of that side, and just above the corresponding Semilunar Valve; it passes in a very tortuous manner towards the right side across the upper surface of the Heart, in the interstice between the right Auricle and Ventricle; it then turns round the Margo Acutus of the Heart in the continuation of the interstice; subsequently across the under surface of the Heart, still in the continuation of the same interstice; and opposite to the middle of the Base of the Heart it (nearly wasted) inosculates with the termination of the left; and remits a *small branch* along the under side of the Septum Ventriculorum, in the interstice between the position of the two ventricles, to the apex of the Heart, which inosculates there with a branch from the left Coronary.

2. The ARTERIA CORONARIA SINISTRA arises from the posterior and left side of the Sinus Aortæ, from the Sinus Valsalva of that side, and above the Semilunar Valve that corresponds with it. It is very tortuous—at first, it inclines forwards and to the left side, so as to emerge from behind the left side of the Pulmonary Artery, where it bifur-

cates: one branch descends along the anterior side of the Septum Ventriculorum in the interstice that is upon the anterior surface of the Heart, between the position of the two Ventricles; and at the Apex inosculates with the small descending branch from the termination of the right: the branch which is the largest and seems more like the continuation of the Artery, passes transversely in the interstice between the left Auricle and Ventricle, and winds round the Margo Obtusus of the Heart to the flat under surface, there inosculating with the termination of the right.

ARTERIES ARISING FROM THE ARCH OF THE AORTA.

These consist of *three trunks,* which emerge from the cavity of the Thorax, to supply the superior part of the body; viz., the Head, Neck, Breast, and the two superior extremities—these arteries emerge from the superior aperture of the Thorax in the following manner:

1. The Arteria Innominata arises from the commencement or the superior and anterior part of the Arch; passes obliquely upwards and towards the right side, in front of the Trachea, and behind the first bone of the Sternum; and bifurcates behind the Cartilage of the right first Rib, and about two inches above its origin, into the right Common Carotid and the right Subclavian: the first ascends on the Longus Colli muscle by the side of the Trachea; the last passes outwards

across the upper surface of the first rib, within the lower part of the Neck.

2. The ARTERIA CAROTICA SINUSTRA arises from the middle and highest part of the Arch of the Aorta, immediately behind the Arteria Innominata, so that there is no evident interspac between them: it is also rather before the left side of the Trachea; it ascends and makes a very slight inclination backwards and to the left side, so as to pass from before the left side of the Trachea, and to get exactly by the left side of the Trachea and against the Longus Colli Muscle; and in this manner emerges from the Thorax posteriorly to the left side of the first bone of the Sternum; subsequently ascending in the neck, upon the Longus Colli, and by the side of the Trachea.

3. The ARTERIA SUBCLAVIA SINISTRA arises from the upper and posterior part of the Arch of the Aorta, a little distance behind the left Carotid, and consequently nearer the termination of the Arch and the Dorsal Vertebræ,—a broader interspace being between the origin of this and the left Carotid (although they are both passing to the left side) than between the left Carotid and the Arteria Innominata,—and, of course, it is much deeper within the cavity of the Thorax than that of the right Subclavian. It passes upwards, and bears more obliquely than the left Carotid, towards the left side, so as to emerge from the Thorax posteriorly to the articulation of the first bone of the Sternum to the sternal extremity of the left Clavicle; then gaining the level of the left first

Rib, it passes outwards across its upper surface, and between the insertions of the Scalenus Anticus and Medius Muscles, in the lower part of the neck, like the right Subclavian Artery. As these vessels are emerging from the Thorax, they are crossed, behind the Sternum, by the left Subclavian Vein, which passes anteriorly to them, but more closely across the Arteria Innominata, and nearly at right angles to it; for the Arteria Innominata is inclining upwards, and the left Subclavian Vein (sometimes called Vena Innominata at this place) is inclining downwards. The order of the parts behind the middle of the first bone of the Sternum and Inter-Clavicular Ligament, being the left Subclavian Vein, the Arteria Innominata, Trachea, and Esophagus; the left Carotid and Subclavian Arteries are also behind the Sternum, but a little more towards the left side than these.

ARTERIA CAROTIS COMMUNIS.

The ARTERIA CAROTIS COMMUNIS.—The right Carotid arises from the bifurcation of the Arteria Innominata, posteriorly to the Cartilage of the right first rib:—the left Carotid from the arch of the Aorta; and having made its inclination to the left side of the Trachea, and its emergence from behind the left side of the first bone of the Sternum, ascends precisely like the right, laterally to the Trachea; first upon the Longus Colli, and then upon the Rectus Capitis, Anticus Major; the two diverging a little, so as to leave room for the interposition of the Larynx; and corresponding with the superior Cornu of the Thyroid Cartilage, or the Cornu of the Os Hyoides; each bifurcates into the external and internal Carotids.

The Artery, during its ascent, is *bounded*—*internally*, first, by the Trachea and Esophagus, and higher up in the neck by the Larynx and lateral lobe of the Thyroid Gland, which latter organ frequently overhangs it a little: *externally*, by the internal Jugular Vein and Par Vagum: *posteriorly* by the muscles that it ascends upon: and *anteriorly*, at the lower part of the neck, by the beginning of the Sterno Thyroideus, Hyoideus, and the commencement of the anterior belly of the Omo-hyoideus; also, still more extensively, and superficially, by the Sterno Cleido Mastoideus; the upper inch, however, of the Artery is uncovered by the latter muscle, and seen anteriorly to its edge in a deep angular-shaped cellular cavity, which is bounded before by the angle of the Thyroid Cartilage, and behind by the anterior edge of the muscle,—here its pulsation can be felt, as it is only covered by the common integuments, Platysma-myoides and by the Fascia of the neck (which coverings stretch from side to side over this cavity), and the investing sheath of the Carotid.

Concomitant Organs.—Those contained *within the sheath* of the Carotid consist of the Internal Jugular Vein, situated by the outer side of the Artery, and the Par Vagum between and rather behind them; these are placed in the *outer side* of the sheath, and are parted from the Artery by the cellular septum of the sheath. The concomitant parts *outside the sheath:* the Sympatheticus Maximus is behind the sheath; and the descending branch of the ninth pair of nerves on the fore part (sometimes in the sheath), covered by the anterior edge of the Sterno-Cleido Mastoideus muscle along with the sheath itself.

This Artery preserves its cylindrical form, as it usually gives off no branches.

ARTERIA CAROTIS EXTERNA.

The ARTERIA CAROTIS EXTERNA arises from the bifurcation of the common Carotid Artery. In ascending, it makes a very slight inclination outwards and backwards: it is first seen passing upwards for a short distance, when it becomes concealed behind the posterior belly of the Digastricus and Stylo-hyoideus muscles, (passing between the latter and the Stylo-glossus, as the last named muscle is suspended upon the Ligamentum Stylo-glossum), and being guarded by the angle of the lower jaw: it is then continued upwards behind the ascending ramus of the lower jaw; within a deep cavity, formed in front, by the ascending ramus of the lower jaw, and the posterior edge of the masseter muscle; behind, by the mastoid process of the temporal bone, and the insertion of the Sterno-cleidomastoideus muscle; the artery being deeply buried within the substance of the Parotid Gland, the major part of which, consequently, bounds it superficially; more deep-seatedly than the Artery, there is the deepest part of the Parotid Gland: and the origins of the Stylo-glossus and Stylo Pharyngeus muscles (which are in some degree parted by the deeper lobules of the Parotid Gland); while still within the Gland, and just behind the upper part of the ramus of the lower jaw, the Artery bifurcates into its two final branches, the superficial temporal, and the internal maxillary. Crossing the superficial side of the bifurcation, within the Gland, is the Portio Dura, vel Nervus Communicans Facei. This Artery, as it ascends, gradually divides into eight branches,—by which it has a wide distribution, supplying the upper part of the neck, the face, and the parts externally to the skull. Three of them arise from the anterior side of the Artery; viz.:—

1. ARTERIA THYROIDEA SUPERIOR arises from the anterior side of the External Carotid Artery, at or immediately above its commencement, or sometimes from the termination of the common Carotid Artery. It bends downwards and forwards, in a tortuous manner, behind the Omohyoideus, Sterno-thyroideus, and Sterno-thyroideus muscles, towards the lateral lobe of the Thyroid Gland: in which it divides into two sets of branches; one, descending in the lateral lobe, inosculates with the inferior Thyroidal Artery; the other passing through the Isthmus of the Gland, inosculates with the corresponding branches of the opposite Artery. Just after its origin, and before it passes behind the Omohyoideus, it gives off the *Arteria Laryngea Interna*, the Internal Laryngeal branch: a small branch that passes forwards with

the superior Laryngeal Nerve from the Par Vagum, behind the Thyreo-hyoideus muscle; perforates the Ligamentum Thyreo-hyoideum, and is dispersed by small ramifications, with its concomitant nerve, to the mucous membrane and Cordæ Vocales within the Larynx.

2. ARTERIA LINGUALIS is given off a little higher than the last described. It first bends a little downwards, then turns upwards and forwards over the corner of the Os Hyoides, and becomes first concealed behind the tendon of the posterior belly of the Digastricus and Stylo-hyoideus; then behind the Hyo-glossus. Before it passes behind the tendon of the Digastricus, it sends off the small *Hyoideal branch*, which passes downwards and forwards, and is distributed to the attachments of the muscles covering the base of the Os Hyoides. Behind the Hyo-glossus muscle it gives off the *Arteria Dorsalis Linguæ;* rather a small branch, but larger than the last; it ascends behind the Hyo-glossus muscle to be distributed to the base of the Tongue; and by the extremities of some of its ramifications, that extending still higher, and emerge from the base of the Tongue, it supplies the lower part of the arches of the Palate and the Amygdala, along with the Palatinus Inferior. *Arteria Sublingualis*, given off just before the Lingual artery emerges from behind the Hyo-glossus muscle, and turns outwards and forwards to supply the Hyo-glossus muscle and Sublingual gland: the distribution of this is con-

cealed by the Mylo-hyoideus muscle. The *Arteria Ranina* is the continuation of the artery, and by much the largest branch; it turns upwards and forwards in a tortuous manner, so as to emerge from behind the Hyo-glossus muscle; and is then continued forwards, by the side of the insertion of the Genio-hyo-glossus, being between the latter and the Sublingual gland, with the Gustatory twig of the inferior Maxillary nerve, and the Warthonian duct; is progressively expended during this course in small ramifications, given upwards to the substance of the tongue, which it is immediately beneath, and ends towards the tip of the tongue, a little posteriorly to the Frenum Linguæ.

3. ARTERIA FACIALIS, seu MAXILLARIS EXTERNA, arises from the anterior side of the external Carotid, a little above the Lingual artery: passing upwards and forwards, in a very tortuous manner, it becomes almost immediately concealed behind the tendon of the posterior belly of the Digastricus, and insertion of the Stylo-hyoideus muscle: then sinks deeply in the hollow space behind the base of the lower Jaw, being buried in the under part of the Submaxillary gland; for it here passes through a cellular interstice, that partially parts the gland into two lobules, a small deep seated and a larger superficial one: its continuation rising out of the hollow of the Submaxillary Gland turns obliquely over the base of the lower Jaw, at the anterior edge of the Masseter muscle; and then ascends obliquely across the face towards the angle

of the mouth, being concealed at the latter place beneath the blending of the depressor Anguli Oris and the Zygomatic muscles; the meanderings of the artery becoming smaller proportionately to the diminution of its size, it next ascends in a more perpendicular direction by the side of the Alæ Nasi, and ends at the space between the internal Canthus and the root of the nose in an inosculation with the termination of the Ophthalmic: this inosculation is a communication between the external and internal Carotids. The Facial vein begins by its side at the internal Canthus, descends straighter and more posteriorly than the artery, and distantly from it over the side of the face, and meets it again upon the base of the lower Jaw.

The branches of the artery are as follow:—the *Arteria Pallatina inferior* is given off from the Facial Artery, a considerable distance below the base of the lower Jaw; ascends by the inner side of the Stylo-glossus muscle to be dispersed upon the lower part of the Palate, with some ramifications of the Dorsalis Linguæ.

Arteria Submentalis, a small artery which is given off just before the artery reaches the base of the lower Jaw; passes forwards a little distance below the base of the lower Jaw, between the Mylo-hyoideus muscle and the Submaxillary gland, and is distributed in a great degree to each; its slender continuation turns upwards over the base of the lower Jaw, by the side of the anterior belly of the Digastric muscle; and inosculates on the surface of the chin with the termination of the inferior Maxillary artery and the Labialis inferior, behind the contiguous parts of the Depressor Anguli Oris and Depressor Labii Inferioris muscles.

The Arteria Labialis Inferior is given off from the artery when it gets upon the side of the lower Jaw; it passes forwards upon the surface of the lower Jaw, behind the Depressor Anguli Oris; inosculates behind this muscle, and on the side of the chin, with the termination of the inferior Maxillary and Submental arteries; and then ramifies along with them and the inferior Maxillary nerve, in the last-mentioned muscle and the Depressor Labii Inferioris.

The artery next bends forwards to the angle of the mouth, and sends off the two *Coronary arteries.*

The *Arteria Coronaria Labii Inferioris* passes forward, tortuously and superficially, in the red edge of the upper lip, being only covered by the thin integuments; and at the middle of the lip unites with its fellow. *Arteria Coronaria Labii Superioris* passes forwards in the same manner within the edge of the upper lip; and at the middle joins the termination of its fellow. Thus these four Coronary arteries, by their inosculations, form a tortuous arterial circle around the mouth, called *Arteria Coronaria Labiorum.*

Arteriæ Massetericæ et Buccales, ramifications which bend backwards to the Masseter and Buccinator muscles.

Arteriæ Nasales Septi, a few small branches which turn upwards, partly from the Facial and partly from the Superior Coronary, and pass along the under edge of the Septum Nasi to the Apex Nasi. *Arteria Nasalis Lateralis*, given off from the Facial as it ascends by the Ala Nasi; it passes downwards and forwards in small diverging branches upon the side of the nose, supplying the Compressor Naris. Then the extremity of the Facial Artery, called *Arteria Angularis*, completes its ascent by the Ala Nasi, and inosculates with the Ophthalmic by the Internal Canthus of the eye. From the union of the two arteries, a small branch, called the *Nasalis Anterior*, descends by the side of the bridge of the nose, towards the tip, inosculating upon the Alæ Nasi during its descent with the Nasalis Lateralis, and at the tip with the Nasales Septi.

One branch arises from the internal or deep-seated side of the external Carotid; viz.:—

4. The ARTERIA PHARYNGEA ASCENDENS HALLERI, or PHARYNGEA INFERIOR; a slender branch which begins from the commencement of the External Carotid, and not unfrequently from the bifurcation of the common Carotid, but sometimes from the Occipital; it passes upwards behind the External Carotid (and may be seen by separating the two Carotids), anteriorly to the Rectus Capitis Anticus Major, and laterally to the constrictors of the Pharynx, in a slender and undivided form for some distance; and then ramifies at once upon the Constrictor muscles, and inosculates with the Superior Pharyngeal branch

which also supplies them; its slender extremity enters the Foramen Lacerum Anticum, and becomes completely spent in the Dura Mater immediately around that Foramen.

Two arise from the posterior side of the External Carotid; viz. :—

5. The ARTERIA OCCIPITALIS.—This usually arises nearly opposite to the External Maxillary, sometimes considerably higher: it passes upwards and backwards obliquely across the Internal Carotid Artery and the Internal Jugular vein, on a line with the under side of the posterior belly of the Digastricus and Stylo-hyoideus muscles: it afterwards passes in a superficial sulcus upon the temporal bone, behind the Mastoid process, and between that and the transverse process of the Atlas; being covered and concealed by the insertion of the Sterno-cleido mastoideus: it then ascends over the Occiput, and winds round the insertion of the Complexus muscle, continuing to be concealed by the insertion of the Splenius Capitis and Trachelo-mastoideus muscles; i. e. it is situated superficially to the Complexus, but beneath the Splenius and Trachelo-mastoideus; sometimes it passes between the Splenius Capitis and Trachelo-mastoideus: then emerging from beneath the Splenius Capitis, and meeting with the Occipital branch of the first Cervical nerve (which runs up through the Complexus), it becomes superficial with it by the outer edge of the Trapezius muscle, an inch and a half from the

tubercle of the Occipital bone; subsequently ascends subcutaneously and very tortuously with the continuation of the nerve, towards the vertex of the head, and unites with the Posterior Auricular Artery and the posterior division of the Superficial Temporal.

6. ARTERIA AURICULARIS POSTERIOR arises from the External Carotid, a little higher up than the Occipital artery; sometimes from the Occipital, being considerably smaller than that. It proceeds likewise, obliquely upwards and backwards, but ranges on a line with the superior edge of the posterior belly of the Digastric muscle, or a little above it, or frequently behind the union of it with the under side of the Parotid Gland; it then ascends behind the concha of the Ear, covered by the integuments that connect the back of the Concha to the side of the head; and continuing its ascent a little higher upon the side of the head, ultimately inosculates with the posterior division of the Superficial Temporal and the Occipital arteries. It gives off the *Arteria Stylo-mastoidea,* which proceeds upward through the Foramen Stylo-mastoideum, penetrates the petrous portion of the temporal bone, and supplies the muscles and Periosteum within the Cavitas Tympani. The *Arteria Auricularis Anterior,* which is sent off from the posterior Auricular Artery, passes forwards to supply the lobe Meatus Auditorius Externus, Tragus, and the anterior side of the Concha.

The External Carotid bifurcates behind the upper part of the Ramus of the lower Jaw, and in the upper part of the Parotid Gland, into the *two final branches* which follow:

7. The ARTERIA TEMPORALIS SUPERFICIALIS, which ascends nearly in a straight line with the External Carotid, and would seem to be a continuation of it: emerging from the upper part of the Parotid Gland, it becomes subcutaneous and turns tortuously over the Zygoma half an inch anteriorly to the Tragus; then ascends over the Temporal Fascia upon the side of the Head; and an inch, or generally within two inches, above the Tragus, bifurcates into an Anterior and a Posterior branch. The *Anterior* or *Frontal branch* passes obliquely upwards and forwards, upon the Temple, some little distance above the Supercillary Ridge, towards the forehead, and inosculates there with the Frontal branch of the Ophthalmic Artery; the two unitedly supplying the Frontal belly of the Occipito-Frontalis muscle. This inosculation is another communication between the Ophthalmic branch of the Internal Carotid and the branches of the External Carotid. The *Posterior*, *Parietal*, or *Occipital branch*, passes upwards and backwards over the Temporal Fascia, corresponding with the Parietal Bone; and towards the vertex of the Head it inosculates with the Occipital and the Posterior Aural Arteries.

The Temporal Artery also gives off the following: The *Arteria Transversalis Faciei* is a small tortuous artery which usually arises from the beginning of the Superficial Temporal; but sometimes from the termination of the External Carotid, making that a trifurcation; proceeding forwards, it emerges from the anterior side of the Parotid Gland, then continues its course transversely across the Masseter muscle concomitantly with the Transverse Branch of the Pes Anserinus, and about a quarter of an inch above the Stenonian Duct; and is lost among the muscles corresponding to the upper lip, partly supplying them; and inosculates behind the Levator Labii Superioris Proprius with the Infra Orbitar branch from the Internal Maxillary artery; and by more promiscuous ramifications, more superficially, with the Facial artery. The *Arteriæ Temporales Profundiores* are two small arteries which arise just before the artery turns over the Zygoma, and pass upwards behind the Zygoma into the Temporal muscle; or else turn upwards with the artery over the Zygoma and perforate the Temporal fascia, to be continued into the muscle.

The final branches from the bifurcation, the Frontal and the Parietal, are already described.

8. The ARTERIA MAXILLARIS INTERNA arises from the bifurcation of the External Carotid, and turns inwards behind the upper part of the ascending ramus of the lower Jaw; then slips upwards and forwards, lying between the inner side of the Cervix and the insertion of the External Pterygoid muscle; it then winds upwards round the upper side of the External Pterygoid muscle, and dips down between the Pterygoideus Externus et Inter-

nus; and afterwards, continuing a tortuous course, passes upwards and forwards between the two Pterygoid muscles towards the posterior part of the bottom of the Orbit,—against the posterior part of the Tuberous Process, below the posterior part of the Spheno maxillary Fissure, and externally to the Foramen Spheno-palatinum it divides widely into its last and largest branches.

[The larger and more important branches of this artery are marked in capitals; the lesser ones in Italics.]

During its course it gives off the following:—

1. The ARTERIA MENINGEA MEDIA, or the ARTERIA SPINOSA DURÆ MATRIS.—This is the largest of the Meningeal arteries. It is the first branch that arises from the upper side of the artery; and as it is between the Pterygoid muscles. It ascends from between the two Pterygoid muscles through the Foramen Spinosum of the Sphenoid bone and enters the Dura Mater; it then ascends in the structure of the Dura Mater, over the internal surface of the Squamous portion of the Temporal bone, where it divides into two branches: the Anterior and largest branch passes upwards through the Canalis Spinosus in the Sphenoidal Angle of the Parietal bone, then enters the Dura Mater again, and is distributed through it in ramifications beneath the anterior part of the Parietal bone; marking that part of the inner surface of the bone with a set of corresponding arborescent Sulci: the lesser posterior branch passes upwards and

backwards posteriorly to the former, and is distributed through the Dura Mater beneath the posterior part of the inner surface of the bone; which it marks with a corresponding and lesser series of Sulci.

2. The *Arteria Meningea Parva* passes upwards from between the Pterygoid muscles through the Foramen Ovale, and is spent in the Dura Mater contiguous to the Foramen.

3. ARTERIA MAXILLARIS INFERIOR, VEL DENTALIS, is the first that arises from the under side of the Internal Maxillary Artery, about an inch distant from its origin. It first passes downwards between the Pterygoideus Externus et Internus muscles; and having passed the Pterygoideus Externus it is left between the Pterygoideus Internus and the ascending ramus of the lower Jaw, and here slips between the ascending ramus of the Jaw and the Ligamentum Laterale Internum, which latter wards off the pressure of the Pterygoideus Internus muscle from the artery and its concomitant nerve, during the elevation of the Jaw: it then passes through the Foramen Maxillare Posticum; and is continued forwards through the side of the Jaw in the Canalis Mentalis, is situated (as it is within the canal) amidst the Cancelli of the bone, between its two tables, inferiorly to the Alveolar Sockets, and superiorly to the base of the lower Jaw: it then emerges from the Foramen Maxillare Anticum behind the Depressor Anguli Oris; inosculating behind this muscle, and in the substance of the Depressor Labii Inferioris upon the fore

part of the chin, with the Labialis Inferior and Submental Arteries. This gives off, as it passes forwards through the Mental Canal, small *Dental Arteries*, which proceeding upwards perforate the upper side of the Canal, enter the Alveolar Sockets, ascend through the canals in the fangs of the Teeth, and expand into minute ramifications, which are suspended within the nervous pulp in the body of each tooth, and which are supposed to pervade the osseous substance of the tooth, or else to supply the vitality of that by some other means than a common arrangement of vessels or circulation of blood, and which is unknown. Just before it emerges from the Anterior Mental Foramen, it gives forwards a little branch through a small continuation of Canal to supply the Incisor Teeth called *Arteria Incisiva.*

4. The *Arteria Pharyngea Superior*, vel *Descendens*, is given off as the artery passes by the superior part of the Pharynx, and is distributed to the upper part of the Pharynx, inosculating with the Arteria Pharyngea ascendens Halleri: these two arteries, and their corresponding ones of the opposite side, supply the Pharynx.

5. and 6. The *Arteriæ Temporales Profundissimæ* are two small branches which pass outwards to the deeper parts of the Temporal muscle.

7. The *Arteria Alveolaris* passes off from the artery near the Spheno-Maxillary Fissure, winds obliquely downwards and forwards round the back part of the Tuberous Process of the Su-

perior Maxillary bone, and then, stretching forwards along the outer side of the Alveolar Process, gives inwards ramifications through the Alveolar Process, which partially supply the posterior molar teeth, and chiefly becomes spent in the outer side of the Gum.

8. The *Arteria Lachrymalis*, a small artery proceeding upwards and forwards, through the Spheno-Maxillary Fissure, to the Lachrymal Gland, and the contiguous parts. The Lachrymal Gland is chiefly supplied by this and the Lachrymal branch from the ophthalmic artery.

The following are the three larger ones passing off from the termination of the Internal Maxillary Artery in the Spheno-pallatine Fissure, behind the Orbit:—

9. The ARTERIA PTERYGO PALATINA, or PALLATINA SUPERIOR, descends through the Canalis Pterygo-palatinus, emerges upon the palate from the Foramen Pallatinum Posticum, or Pterygo-pallatinum; then passes forwards upon the Palatine Process of the Superior Maxillary bone, by the internal side of the Alveolar Process, being covered by the mucous membrane of the Palate,—to be distributed to the posterior Molar Teeth by branches which pass through the Alveolar Process, to the upper part of the arches of the Palate, and to the internal side of the gum. An extreme branch turns up through the Foramen Incisivum, or Palatinum Anticum, and inosculates in the process of mucous membrane filling that up, with the next artery.

The Palate is supplied by the artery last described; the Arteria Pallatina Inferior, from the External Maxillary; and the Dorsalis Linguæ from the Lingual Artery.

10. The ARTERIA SPHENO-PALATINA, or NASALIS LATERALIS, arises from the grand termination of the Internal Maxillary Artery; passes horizontally inwards through the Foramen Spheno-palatinum, and immediately divides into branches which are spread widely over the side of the nose; supplying the mucous membrane lining the side of the nose, the superior and inferior Turbinated Bones, the Antrum Highmorianum, and, by the extension of some of its most extending branches, the membrane lining the Ethmoidal Cells and the Frontal Sinuses. One branch is continued downwards and forwards through the inferior Turbinated Bone, then passes along the floor of the nose by the lower part of the Septum, supplying the Schneiderian membrane in its course, and terminates in the Foramen Incisivum by inosculating (within the membranous process in that Foramen, which unites the membranes of the mouth and nose) with the Pterygo-palatine. All these branches of the Pterygo-palatine and Spheno-palatine are situated beneath the Schneiderian membrane, but are gradually remitted, in minute ramifications, to the substance of the Schneiderian membrane.

11. The ARTERIA INFRA ORBITALIS arises from the termination of the artery in the Spheno-palatine Fissure, and passes forwards nearly on a

line with the artery through the Foramen Lacerum Orbitale Inferius and Infra Orbitale Canal, emerges from the Foramen Infra Orbitale between the origins of the Levator Labii Superioris Proprius and the Levater Anguli Oris; and then descending in branches between these two muscles, it inosculates with the Arteria Transversalis Faciei, and the external maxillary artery, being dispersed to the substance of these last named muscles, and the others which correspond to the upper lip.

ARTERIA CAROTICE INTERNA, SEU CEREBRALIS.

The **Internal Carotid Artery** arises from the bifurcation of the common Carotid Artery, between the External Carotid Artery and the Internal Jugular Vein. It ascends for a short distance between them, and, like them and the termination of the common Carotid Artery, is seen in the anterior region of the neck, before the anterior edge of the Sterno-cleido-mastoideus muscle; covered only, like them, by the integuments of the neck: but, because it is here more or less dilated in size, it is called the *Sinus Cerebralis*, and its surface is generally bulged forwards rather nearer the integuments than the External Carotid; on account of which it may be said to be of the two the most superficial. It then arches backward, and comes against the Rectus Capitis Anticus Major;* so as to ascend upon its belly, behind the posterior belly of the Digastricus, Styloid muscles, ascending ramus of the Lower Jaw, and Parotid Gland—laterally to the Pharynx

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* The dilitation of its commencement, and this arch, are by no means constant:—sometimes it insensibly inclines backwards.

—till it comes against the under surface of the base of the Cranium; it then makes a slight turn forwards under the base of the Cranium to enter the Canalis Caroticus; and afterwards passes upwards and forwards through the Canalis Caroticus; then winds forwards, over the Foramen Lacerum Anticum, into the Cranium, being supported upon the slender lamina of cartilage that fills up the Foramen; it is then continued upwards upon the Sulcus Cerebralis of the Splenoid bone by the side of the Sella Turcica, where it is covered over by the Sphenoidal fold of the Dura Mater, and embraced by the plexus of Veins forming the Cavernous Sinus—the Nervous Abducens, and the filaments reflected backwards from it, into the Canalis Caroticus, being supported upon its outer side; lastly, it winds upwards, and perforates the Dura Mater by the Internal side of the Anterior Ephippial process, so as to enter the serous cavity of the Cranium; and suddenly spreads into its Cerebral branches, which pass for a certain distance beneath, and then up between the lobes of the Brain—are only at first slightly connected to the surface of the Brain, by small casual ramifications, and are afterwards gradually continued into the structure of the Pia Mater, through which their subdivisions spread.

In the Cavernous Sinus, the Internal Carotid Artery gives off the ARTERIA RECEPTACULI ANTERIOR ET POSTERIOR, two small branches which supply the anterior and posterior parts of the Cavernous Sinus, and the Sphenoidal fold of the Dura Mater. The termination then divides into the Arteria Ophthalmica, Arteria Anterior Cerebri, Arteria Media Cerebri, and Arteria Communicans.

The ARTERIA OPHTHALMICA, or ARTERIA OPTICA, arises from the anterior side of the termination of the artery, and passes forwards, so as to take its exit from the cavity of the Cranium almost immediately, through the Foramen Opticum externally and inferiorly to the Optic Nerve; it is then continued forwards and outwards to the outer side of the Orbit; then passes inwards, in a tortuous manner, across the cavity of the Orbit, superiorly to the Optic nerve, so that it surrounds in a certain degree the nerve; then emerges from behind the Internal Canthus of the eye, and, at the space between the Internal Canthus and the root of the nose, inosculates tortuously with the termination of the External Maxillary Artery.

Branches given off from the Ophthalmic, where it is by the Temporal side of the Optic nerve, are those that follow :—

The *Arteria Lachrymalis* arises from the Ophthalmic as it is entering the Orbit; and passes outwards and forwards to the Lachrymal Gland, adjacent Periosteum, and other parts.

As soon as the artery passes through the Foramen Opticum, it gives off the *Arteria Centralis Retinæ:* this is very small. It perforates the Optic nerve, and is continued forwards through its entre—when a transverse section of the nerve was formerly made a little behind the ball to illustrate its position; the orifice, forming a small pore, was termed the ***Porus Opticus*** : it is still continued forwards, in the fasciculated substance of the Optic nerve, through the Crebriform part of the Tunica Sclerotica and Tunica Coroides; and then, at the Medullary Tubercle of the Retina, abruptly scatters into a number of minute ramifications, which are dispersed through the Tunica Vasculosæ Retinæ, and nourish the Retina. *A branch* in the fœtus passes through the centre, or the axis of Vitreous Humour, and meets the posterior part of the axis of the Crystalline Lens; on which it divides into branches, which radiate, through the Tunica Crystallina, over the posterior convex surface of the Lens, and then pass round the circumference of the Lens to the anterior convex surface in the continuation of the Tunica Crystallina; whence they are continued forwards to the Membrana Pupillaris, in a membranous suspension, which is supposed by some to be the Tunica Vasculosæ Retinæ, continued forwards from the front of the Tunica Crystallina to the Membrana Pupillaris. The Membrana Pupillaris is supplied from two sources, viz., by the Centralis Retinæ, and also by extensions of some of the Ciliary Arteries from the Iris.

Branches given off from the Ophthalmic superiorly to the Optic nerve:

The *Arteriæ Ciliares* consisting of the Arteriæ Ciliares Posteriores, Longiores, et Anteriores.

The *Arteriæ Ciliares Posteriores* or *Breviores*, are a few small arteries which arise from the Ophthalmic, and perforate the Sclerotic Coat by the sides of the Optic nerve, and pass into the Coroid Coat. *The Arteriæ Ciliares Longiores* are usually two in number, and the largest of the Ciliary Arteries. Each passes forwards by its respective side of the ball of the eye—they perforate the Tunica Sclerotica exactly opposite to the axis of the ball, and mid-way between the entrance of the Optic Nerve and insertion of the Recti Muscles, and pass into the Coroid Coat. The *Arteriæ Ciliares Anteriores* are smaller, but usually more numerous, branches than the posterior, which arise more promiscuously, partly from the Ophthalmic, and partly from the muscular branches scattered in the Orbit; perforate the Tunica Sclerotica, at the insertions of the Recti muscles, and just beneath the reflection of the Tunica Conjunctiva, and so enter the Coroid Coat. All these Ciliary Arteries pass forwards, in one series, through the superficial surface of the Coroid Coat; connected together by Cellular Membrane, so as to form the smooth superficial surface of the Coat in a great degree; while they are partially expended, in a very gradual manner, by minute ramifications which are continually inflected from them, so as to form the internal billous surface of the Coat, called the Tunica Ruyschiana, which secretes the Pigmentum Nigrum. The Arteries beneath the Ligamentum Ciliare, and at the root of the Iris, divide into branches which, bending aside, inosculate laterally, and, so as to constitute the *Circulus Arteriosus Iridis,* an Arterial circle in the root of the Iris. From this, smaller continuations of the Ciliary Arteries pass inwards and forwards through the substance of the Iris, and gradually converging, meet and inosculate, so as to form a minor arterious circle at a little distance from the edge of the pupil : this may be called *Circulus Arteriosus Iridis Secundus*, vel *Minor ;* —from whence still more minute continuations of the Ciliary Arteries pass inwards exactly to the pupillary margin of the Iris.

The *Arteria Frontalis*, or *Supra Orbitalis*, arises from the Ophthalmic artery also, above the Optic nerve, and is frequently the largest branch : it passes forwards through the upper part of the Orbit, beneath the Orbitar process and the Periosteum, and between the latter and the Levator Palpebræ Superioris, along with its concomitant nerve : it then passes through the Foramen Supra Orbitarium, and ascends upon the forehead, in the Frontal belly of the Occipito-frontalis muscle ; is distributed to it, and inosculates with the Anterior division of the Temporal artery and the Angular branch of the External Maxillary from the external Carotid.

The *Arteria Muscularis Superior* et *Inferior*, arise from the trunk of the Ophthalmic, and are distributed to the muscles in the superior and inferior parts of the Orbit.

Branches given off from the Ophthalmic at the Nasal side of the Orbit:—

The *Arteria Ethmoidalis Anterior* passes through the Foramen Orbitarium Internum Anticum, with the Nasal twig of the Ophthalmic nerve; emerges from the inner edge of the Orbitar process of the Frontal bone at its cranial aspect; then passes along with the nerve, in a superficial sulcus across the anterior part of the Cribriform Plate of the Ethmoid bone; then descending into the Nose, through one of the largest and most anterior of the Cribriform Foramina, is distributed to the Schneiderian Membrane upon the Anterior Ethmoidal cells, and upon the upper part of the Septum Nasi as low as the tip of the nose.

The *Anterior Ethmoidalis Posterior* is a smaller artery, which passes solitarily through the Foramen Orbitarium Internum Posticum, to be distributed to the Mucous Membrane lining the posterior Ethmoidal cells.

The termination of the Ophthalmic Artery is called the *Arteria Angularis* or *Ophthalmica*, which emerges from the Internal Canthus, and unites with the termination of the Facial at the space between the Internal Canthus and the root of the nose.

2. The ARTERIA CEREBRALIS ANTERIOR, seu CORPORIS CALLOSI, arises from the anterior side of the termination of the Internal Carotid artery; it passes for a short distance, forwards and inwards, so as to converge towards the opposite artery—with which it becomes united by a *short tranverse*

branch of a variable calibre, just anteriorly to the Processus Olivaris and Tractus Nervorum Opticorum. They then ascend together in the interstice between the Anterior Lobes of the Cerebrum, turning round the anterior extremity of the Corpus Callosum; and are afterwards reflected backwards along the Labii Cerebri, upon which they are distributed in branches supplying them and the adjoining parts of the hemispheres. They are situated in their distribution superiorly to the Corpus Callosum; along with the Inferior Longitudinal sinus, which is situated between them, in the edge of the Falx Major.

The ARTERIA MEDIA CEREBRI, seu FOSSÆ SYLVIANÆ, is the largest of the branches distributed to the Brain, with the exception of the posterior Cerebral. It arises from the outer side of the termination of the Internal Carotid; and passes upwards and outwards, in the Interstice between the anterior and middle lobes of the Brain, opposite to the Alæ Minoris Ingrasii of the Sphenoid bone, called the Fissura Magna Sylvii; it supplies, like its fellow, in its ascent, the contiguous parts of the two Lobes; and then the unexpended continuation of the artery is expanded widely into branches upon the upper surface of the hemisphere; these are the large branches which are seen (if the arteries of the Brain are injected) upon the upper surface of the Brain, when the Dura Mater is first removed.

The ARTERIA COMMUNICANS.—This is a

slender tortuous branch, which arises from the posterior side of the Internal Carotid Artery; and passes backwards, in a reflected course upon the Sphenoidal fold of the Dura Mater, laterally to the Sella Turcica and Infundibulum; and unites with the commencement of the Posterior Cerebral artery.

ARTERIÆ SUBCLAVIÆ.

The RIGHT SUBCLAVIAN ARTERY arises from the bifurcation of the Arteria Innominata, behind the cartilage of the right first rib, in the boundary line between the upper part of the thorax and the neck: it first turns nearly transversely outwards across the upper surface of the first rib, between the insertions of the Scalenus Anticus and Medius Muscles, and distantly behind the Clavicle; it then turns downwards beneath the Clavicle and Subclavius muscle; and as it passes beneath the edge of the Subclavius muscle, it enters the region of the Axille, and becomes the Axillary Artery.

The LEFT SUBCLAVIAN ARTERY arises from the upper and posterior part of the Arch of the Aorta, near the third Dorsal Vertebra. It passes upwards and outwards inclining towards the left side, behind the left side of the first bone of the Sternum; till it gets into the boundary between the neck and Thorax, and gains the level of the left first rib. It then pursues a similar course, through the left side of the neck, to the left Axilla, to that which the right Subclavian does through the right side of the neck to the right Axilla. Observe, that the left Subclavian Artery is longer than the right; that, as it ascends from the

Thorax and inclines towards the left side, it corresponds very nearly with the position of the Arteria Innominata ascending from the Thorax towards the right side; and that the course of the left Subclavian may be divided into three stages: viz., 1st. Its ascent from the Thorax, within the circle of the first rib; 2dly. Its progress across the upper surface of the rib, between the Scaleni; 3dly. Its descent beneath the Clavicle and Subclavius muscle: only the two latter stages, however, can apply to the course of the right.

Boundaries. The Subclavian Artery, while it is opposed to the cavity of the Thorax, and before it gets upon the upper surface of the first rib, is bounded in *front* by some of the filaments that form the continuation of the Sympatheticus Maximus in its passing from the neck into the Thorax, by the Par Vagum, and the Phrenic Nerve; by the lower part of the Internal Jugular Vein, which is situated before the last named nerves, and conceals them; by the origins of the Sterno-hyoideus and Sterno-thyroideus muscles, which are situated anteriorly to the vein, and conceal it at this part; still further outwards, when upon the surface of the first rib, by the Scalenus Anticus; and again more generally and superficially by the Subclavian vein, Supra Scapulary Artery, and Sterno-Cleido-Mastoideus, Clavicle and Platysma-Myoides. *Posteriorly* it is bounded by a part of the Sympathetic, the Salenus Medius, some of the lowest Cervical and the first Dorsal nerves. *Inferiorly,*—the beginning of the Artery (whilst opposed to the cavity of the Thorax, and bounded before by the Sympatheticus Maximus, Par Vagum, Phrenic nerve, Internal Jugular Vein, and Origins of the Sterno-hyoideus et Thyroideus muscles) is bounded by the Cul de Sac of the Plura, which lines its under side: this more particularly applies to the *left* Subclavian, the origin of which is in the cavity of the Thorax, and consequently much lower than that of the right; and as it ascends towards the left first rib the Pleura even rises a little in *front* of it: passing this, it is bounded below by the first rib.

Concomitant Organs. The Subclavian Vein is situated about half an inch more anteriorly than the Artery; the thickness of the insertion of the Scalenus Anticus muscle, being between them; and the vein is in close connection with the posterior side of the Clavicle by condensed Cellular Membrane. The Cervical Plexus of nerves are situated superiorly and posteriorly to the Artery as it is passing outwards, from between the Scalenus muscles and across the first rib; but they get externally and posteriorly, as it is diving beneath the Clavicle into the Axilla.

The Subclavian Artery, thus situated in the lowest part of the neck, gives off six branches: four arise from its upper side and supply a great share of the neck, partly the head, and partly the shoulders; and two from its under side, which partly supply the anterior parietes of the chest.

Two branches arise from the upper side of the

Subclavian Artery, before it passes behind the internal edge of the Scalenus Anticus muscle, and as it is in the upper aperture of the Thorax, viz., the Arteria Vertebralis and the Arteria Thyroidea Inferior.

1. The ARTERIA VERTEBRALIS, arising from the upper side of the right Subclavian Artery just after its origin, or from the left as soon as it gets on a level with the left first rib. At first it passes upwards for a short distance between the lower part of the Common Carotid Artery and the internal edge of the Scalenus Anticus muscle (or, in fact, the origin of the Inferior Thyroid Artery, which is closely against the internal edge of the Scalenus Anticus); being in lateral juxta-position to the Par Vagum and the Inferior Cervical Ganglion of the Sympatheticus Maximus; and behind, like these, the lower part of the Internal Jugular vein,—and covered still more anteriorly, like these, and the beginning of the Subclavian Artery, from which it arises, by the beginnings of the Sterno-hyoideus, Sterno-thyroideus, and also the Sterno-cleido-Mastoideus muscles : it usually bends backwards, into the Foramen Cervicale in the Transverse Process of the sixth Cervical Vertebra, between the Scalenus Anticus and Longus Colli muscles (sometimes it ascends to enter the fifth, fourth, or even third Cervical Vertebra, and then being uncovered by the Transverse processes during this ascent, it appears almost like another Carotid) : it next ascends through the Foramina Cervicalia in the

six superior Cervical Vertebræ; and in passing from the Transverse Process of the Vertebra Dentata to the Transverse Process of the Atlas, it makes its first turn upwards and outwards (because the Transverse Process of the Atlas is much longer than the Transverse Process of the Vertebra Dentata); and as it passes between the Transverse Process of the Atlas and the Foramen Magnum Occipitale, it makes its second turn by winding horizontally inwards in an Osseous Sulcus, round the posterior side of the Superior Oblique Process of the Atlas; it then turns upwards through the Foramen Magnum Occipitale, and perforates the Dura Mater, at the beginning of the Theca Vertebrarum; then inclines obliquely forwards and inwards upon the Basilary Process of the Occipital bone, and beneath the side of the Medulla Oblongata, and so gradually converges towards the opposite Artery, with which it unites beneath the posterior edge of the Pons Verolii to form the Basilary Artery.

BASILARY ARTERY.

The Basilary Artery passes forwards upon the continued surface of the united Basilary Processes of the Occipital and Sphenoid bones, beneath the Pons Verolii; and beneath the Anterior edge of the Pons Verolii, and in correspondence with the Posterior Ephippial Processes, it bifurcates into the Posterior Cerebral Arteries.

Branches from the Vertebral Arteries.

The Vertebral Arteries, as they ascend through the Foramina Cervicalia, give outwards *small ramifications* that pass through the Foramina Intervertebralia, and communicate with the promiscuous arteries in those muscles of the neck which are situated on the Spine. They also send inwards *small ramifications* into the Specus to the Spinal Marrow, that inosculate with the proper Spinal Arteries.

Just before they pass through the Foramen Magnum, they give off the *Arteriæ Meningeæ Posteriores.* A small branch arising from each Vertebral;—they ascend through the Foramen Magnum, and are distributed to the posterior and inferior part of the Dura Mater, contiguous to the Falx Minor.

Just after they have passed through the Foramen

DIAGRAM I.

A PLAN OF THE DISTRIBUTION OF THE ARTERIES OF THE BRAIN AND SPINAL MARROW.

*** The names of the Principal Branches are in Roman Capitals, and those of the secondary ones in Italics.

A. A. The TWO INTERNAL CAROTIDS (as they are by the side of the Sella Turcica).

a. a. The *commencement of the Ophthalmic Arteries.*

b. b. The *Anterior Cerebral, seu Corporis Collosi.*

b^2. The *Transverse Branch.*

c. c. The *Arteria Fossæ Sylvianæ, or middle Cerebral Arteries.*

d. d. The two reflected communicating branches from the two *Carotids.*

B. B. The VERTEBRAL ARTERIES.

e. e. e. e. Promiscuous Branches to the muscles of the neck.

f. f. f. f. Promiscuous Branches to the Spinal Marrow.

g. g. The *Posterior Spinal Arteries.*

h. h. The *Posterior Meningeal.*

i. i. The *Posterior Arteries of the Cerebellum.*

k. k. The *two Anterior Spinal Arteries,* uniting into one.

C. The BASILARY ARTERY.

l. l. Branches to the Pons Verolii.

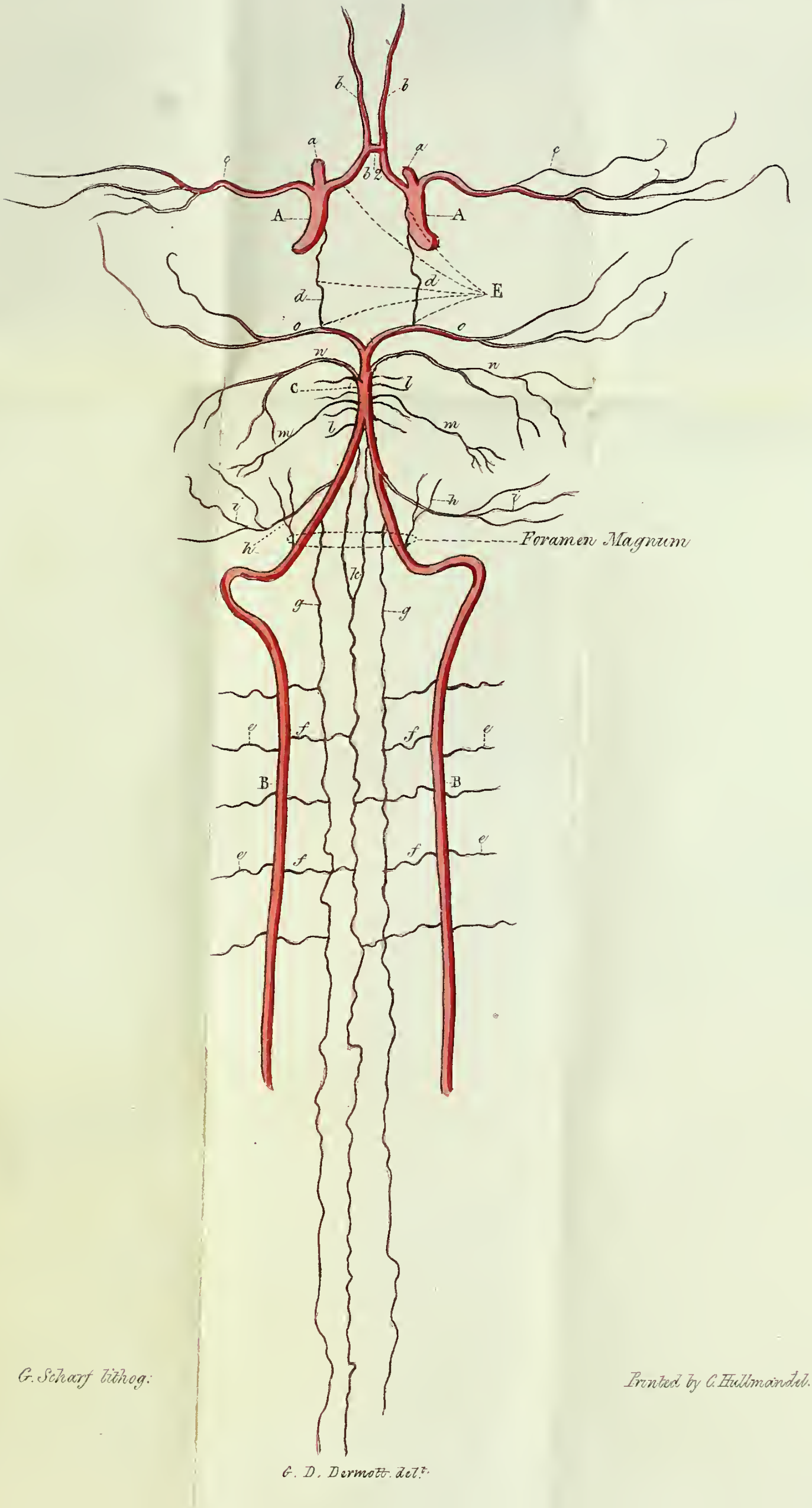
m. m. The *two Internal Auditory Arteries.*

n. n. The *two Anterior Arteries of the Cerebellum.*

o. o. The *two Posterior Arteries of the Cerebrum.*

E. The CIRCULUS ARTERIOSUS WILLESII.

Diag. 1.



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G. D. Dermott del^t.

Magnum, into the cavity of the Cranium, and perforated the Dura Mater, they give downwards the *Arteriæ Spinales Posteriores ;* one from each Vertebral. They descend, in a very slender, tortuous form, through the Foramen Magnum; then along the posterior sides of the two Lateral Columns of the Spinal Cord, within the Specus and Theca Vertebrarum; and inosculate in their descent with the branches sent inwards from the parent trunks of the Vertebrals, within the Specus Vertebrarum of the Cervical Vertebra ; with the branches passing inwards from the commencement of the Intercostal Arteries, within the Specus Vertebrarum of the Dorsal Vertebra; and with the branches given inwards from the Lumbar Arteries, within the Specus of the Lumbar Vertebræ, where they become spent—their place being succeeded by the Sacræ Laterales, which supply the Cauda Equina within the Specus Vertebrarum of the Sacrum.

The *Arteriæ Cerebelli Posteriores :* one comes off from each Vertebral Artery, a little further forwards than the last, and where it gets upon the Basilary Process of the Occipital bone ; they pass obliquely upwards and outwards in the interstice between the under side of the Lobus Cerebelli, and side of the Medulla Oblongata, and branch upon the posterior and inferior part of the Cerebellum.

The *Arteriæ Spinalis Anteriores*, a pair which arise from the Vertebral Arteries where they terminate or just before their union; they pass downwards through the anterior part of the

Foramen Magnum; and at a little distance below the Foramen Magnum, upon the anterior part of the Medulla Spinalis they unite into a single artery; which passes down in a very slender, tortuous, and azygos form, in the anterior interstice between the two anterior columns of the Medulla Spinalis; receiving, like the Posterior Spinal Arteries, inosculating ramifications from the Vertebral Arteries in the neck, from the Intercostals in the back, and from the Lumbar in the Loins, and vanish at the lower part of the Spinal Cord.

The Vertebrals then unite and form the Basilary Artery.

Branches from the Basilary Artery.

The *Basilary Artery gives off*,—The *Arteriæ Pontes Verolii*, which are small branches that arise from the sides of the Basilary Artery, and pass outwards and upwards into the sides of the Pons Verolii.

The *Arteriæ Auditivi Internæ* arise, like two large Arteriæ Pontes Verolii, each from the Basilary Artery; and, passing obliquely outwards and backwards, they emerge from beneath the sides of the Pons Verolii, then pass with the Nervus Acousticus and Portio Dura through the Foramen Auditivum Internum of the same side, are continued through the Foraminulæ in the Crebriform bottom of the same Foramen, each with its Acoustic Nerve, and expanded with great delicacy through the nervous and membranous Labyrinth of the Internal Ear.

The Basilary Artery gives off, just before it terminates, the two *Arteriæ Cerebelli Anteriores:*—these emerge from beneath the anterior part of the Pons Verolii, turn upwards and backwards in a somewhat reflected course, to be distributed upon the upper and anterior part of the Cerebellum, beneath the Tentorium.

It then bifurcates into the two *Arteriæ Posteriores Cerebri*:—these, forming the terminations of the Basilary Artery, pass off at right angles to it, emerging from between the anterior edge of the Pons Verolii and the Posterior Ephippial Processes; then, ascending in front of the edge of the Tentorium, they receive the terminations of the communicating branches from the Internal Carotids, just by the side of the Posterior Ephippial Process; are continued upwards and outwards in the interstice between the middle and posterior lobes of the Cerebrum, and distributed to the contiguous parts of each.

The *Circulus Arteriosus Willesii*, is an inosculation beneath the base of the Brain, (surrounding the Sella Turcica, and parts in correspondence with it), formed between the two Carotids and the Basilary Artery, previously to their distribution in the Cerebrum:—it may be remarked, that the Cerebellum and appendages are supplied from the Vertebrals and Basilary previously to this inosculation. This arterial circle is formed *anteriorly*, by (the two Internal Carotids sending forwards) the two Arteriæ Anteriores

Cerebri; and by the transverse branch uniting them:—*laterally* by (the two Internal Carotids sending backwards) the Arteria Communicantes;—and *posteriorly* by (the Basilary dividing into) the Arteriæ Posteriores Cerebri: from this the blood is dispersed as from one centre.

2. ARTERIA THYROIDEA INFERIOR arises from the upper side of the Subclavian Artery, a little more outwardly than the Vertebral, and just as the Subclavian is passing the internal edge of the Scalenus Anticus muscle; so as to be close against the internal edge of the muscle: like the Vertebral, it is situated behind the lower part of the Internal Jugular Vein, and the origins of the Sterno-hyoideus et Sterno-thyroideus muscles.

It is a short axis or stump which usually gives rise to the five following secondary branches, that in the most regular way pass off from it in a radiation.

1. The *Supra Scapularis, vel Transversalis Humeri*, arises from the Inferior Thyroid Artery, and passes forwards so as to become attached to the posterior side of the Clavicle; it is continued outwards along the posterior edge of the Clavicle, in close cellular connection with it and the Subclavian Vein; it is next continued beneath the anterior edge of the Trapezius muscle, over the Ligamentum Posticum Scapulæ, which latter parts it here from its Concomitant Nerve: it then ramifies in the Fossa Supra-spinata, and supplies the Musculus Supra-spinatus, beneath which it is concealed; its

termination then passes beneath the Acromion, to unite in the Fossa Supra-spinata, with the Dorsal branch of the Infra-scapulary Artery.

2. The *Arteria Transversalis Colli* arises from the Inferior Thyroid Artery, and passes outwards more superiorly than the Supra-scapulary Artery, and about three quarters of an inch above the Clavicle: first, emerging from behind the outer edge of the Sterno-cleido-mastoideus; it crosses the Scalenus Anticus and Cervical nerves, nearly in correspondence with the posterior belly of the Omo-hyoideus muscle; and is distributed to the muscles at the lateral and inferior part of the neck anteriorly to the Levator Scapulæ.

3. *Arteria Trachealis*, a small branch that turns downwards by the side of the Trachea towards the Lungs, and nourishes the Trachea.

4. The *Arteria Cervicalis Ascendens*, a small branch that passes upwards upon the origin of the Scalenus Anticus, and partly upon the Rectus Capitis Anticus Major; partly supplying each, and inosculating with small ramifications that are reflected outwards through the Intervertebral Foramina from the Vertebral Arteries.

5. *Arteria Thyroidea Inferior*, the Inferior Thyroideal Artery, properly so called, is the great continuation of the artery: it passes upwards and inwards, in a tortuous manner, obliquely across the Longus Colli muscle, and behind the sheath of the Common Carotid Artery, where it is enveloped by the filaments of sympathetic descending from the

middle Cervical Ganglion (and which form the continuation of the nerve as low as the Inferior Cervical Ganglion); it then comes against the Lateral Lobe of the Thyroid Gland, and, having touched the Lateral Lobe of the Thyroid Gland, it bends a little downwards (by an abrupt serpentine-like turn), by the side of it, enters its substance, and in the superficial part of the Lateral Lobe of the Gland divides into two sets of branches; one set passes transversely through the Isthmus, and inosculates with the same division of the opposite artery; and the other divisions ascend through the Lateral Lobe, and inosculate with the descending division of the Superior Thyroid Artery.

3. The ARTERIA CERVICALIS PROFUNDA arises from the upper side of the Subclavian Artery, behind the Scalenus Anticus muscle; and bends backwards between the transverse process of the last Cervical and the first Dorsal Vertebræ, through the root of the Scalenus Medius muscle, so as to get into the posterior part of the neck; it then ascends upon the Semi-spinalis Colli, beneath the lower part of the Complexus muscle, and inosculates with the descending Cervical branch of the Occipital.

4. The ARTERIA CERVICALIS SUPERFICIALIS arises from the upper side of the Subclavian Artery, as it is passing behind the outer edge of the Scalenus Anticus muscle, or either a little before, or a little after, it emerges from behind it: immediately after its origin, it turns backwards

between the large Cervical Nerves; it is then continued round the outer side of the Scalenus Medius; and then behind the Levator Scapulæ, where it is partially distributed to the muscles at the lateral inferior and posterior part of the neck: the continuation then obtains the name of the *Arteria Basios Scapulæ*, and turns downwards along the internal side of the base of the Scapula, between the insertions of the Rhomboidei (which it supplies) and the insertion of the Serratus Major Anticus, terminating by an inosculation at the Inferior Angle of the Scapula with the termination of the Infra Scapulary:—this inosculation encircles the inferior angle of the Scapula, and is the most direct inosculation between the arteries of the trunk, and those of the superior extremity.

Two arteries arise from its under side, as it is over the upper opening of the Thorax, and before it passes across the upper surface of the first rib.

5. The ARTERIA MAMMARIA INTERNA arises from the under side of the artery opposite to the origin of the Inferior Thyroid. It descends behind the sternal extremity of the Clavicle; and afterwards passes downwards behind the Cartilages of the Ribs, half an inch laterally to the edge of the Sternum; being first between the Intercostales Interni and Pleura Costalis, and afterwards between the Intercostales Interni and the Sterno-costalis; and at the Cartilaginous edge of the Thorax it divides into two branches.

The commencement of the artery gives off, *Arteriæ Thymicæ*, that pass inwards to the Thymus Gland, and are largest in the Fœtus.

The *Arteria Comes Nervi Phrenici*, or *Diaphragmaticus Superior*. This is a small artery, that arises from the upper part of the artery, and bends backwards between the two bags of the Pleura, so as to come in contact with the Phrenic nerve; then descends with the Phrenic nerve, over the side of the Pericardium, between the proper membrane of the Pericardium and the Pleura Pericarditis, and so meets the convex surface of the Diaphragm; it enters the substance of the Diaphragm; and as it is distributed in it, inosculates with the Inferior Diaphragmatic Artery, inflected branches from the lower Intercostals, and the Phrenic branch from the termination of the Internal Mammary.

Arteriæ Galactoferi pass forwards through the Intercostal muscles between the Cartilages of the Ribs, and through the origin of the Pectoralis Major muscle; then enters the glandular substance of the breast, and with the *Arteriæ Galactoferi* of the Thoracica Longa secrete the milk. The lower part of the artery gives backwards the *Arteriæ Pericardiaco Diaphragmatici*, branches which pass to the Diaphragm and adjoining part of the Pericardium. Then the termination of the artery divides into two branches; namely, the *Arteria Diaphragmatica*, seu *Phrenica*, which passes downwards and backwards, in the origin of the Diaphragm, corresponding with the cartilaginous margin of the Thorax, and inosculates in the substance of the Diaphragm, with the Diaphragmatic branches from the Inferior Intercostals, and the Superior and the Inferior Diaphragmatic Arteries: the *Arteria Epigastrica* descends into the upper part of the Rectus Abdominis, and unites with the termination of the Internal Epigastric Artery from the External Iliac Artery.

6. The ARTERIA INTERCOSTALIS SUPERIOR arises from the posterior and inferior side of the Subclavian Artery, externally to the origin of the Internal Mammary; it passes downwards and backwards behind the upper part of the Pleura, and descends across the necks of the two or three upper Ribs, by the side of the corresponding number of Dorsal Vertebræ, and divides into branches which supply a corresponding number of intercostal spaces;—these, passing forwards inferiorly to their respective ribs, are first between the Intercostales Externi and Pleura Costalis, and afterwards between the Intercostales Externi et Interni;—and at the fore part of the Thorax they inosculate with the Internal Mammary: the last of these branches gives off a branch that passes across the inner side of the neck of the rib below it, which unites with the highest of the Arteriæ Intercostales Inferiores from the Aorta;—and, in common with the latter set, these upper Intercostal branches inosculate, more outwardly, with the External Thoracic Arteries from the Axillary.

ARTERIA AXILLARIS.

The Axillary Artery begins, as the continuation of the Subclavian, beneath the edge of the Subclavian muscle; and descends through the Axilla, inclining somewhat outwards; being first supported upon the upper part of the side of the Thorax, or the Serratus Major Anticus Muscle; then, nearly in correspondence with the second rib, it gradually inclines off the Thoracic side of the axilla, and comes more closely against the Scapulary side, being opposed to the Subscapularis; and afterwards to the united tendons of the Latissimus Dorsi, and Teres Major Muscles; and at the inferior edge of the latter, it emerges from the Axilla, and becomes the Brachial Artery: it is *bounded* on every side by the muscles forming the several sides of the Axilla; viz., *internally* (or towards the Thorax), by the Serratus Major Anticus; *externally and posteriorly* (or towards the Scapula), by the Subscapularis, Latissimus Dorsi, and Terra Major; *anteriorly* (or towards the breast), by the two Pectoral Muscles. Observe, that there is an interval between the upper edge of the Pectoralis Minor and the edge subclavian muscle, where the upper part of the Subclavian Artery is only covered by the Clavicular portion of the Pectoralis Major; and again observe, that the lower part of the Axillary Artery is covered only by the lowest part of the last mentioned of the two Pectoral muscles.

The *Concomitant Organs.* The Axillary Plexus of nerves, in the upper part of the Axilla, where the Axillary Artery is opposed to the interval between the Subclavian Muscle and the Pectoralis Minor, is situated externally and posteriorly to the Artery, or nearer to the Cervix Scapulæ than that; the Artery is situated here a little more inwardly than the Crocoid Process, and corresponds with the intercostal space of the first and second Ribs: where the artery is behind the Pectoralis Minor, and against the Subscapularis, the Plexus closely embraces it: when the Artery gets into the lower part of the Axilla, and is again uncovered by the Pectoralis Minor, and between the Pectoralis Major and Latissimus Dorsi Muscles, the Plexus becomes reduced into the straight commencement of the nerves of the superior extremity, and descends like so many longitudinal cords situated closely around the position of the Artery, so as to emerge like the Artery from the Axilla into the arm. The Axillary Vein is situated closely before the Artery and the Plexus, being consequently between them and the Pectoralis Minor muscle, and closely behind the latter: all these are united by a sheath of fine cellular substance, and deeply buried and supported in the fat filling the Axilla. The Axillary set of Lymphatic Glands are also deeply buried in this fat; and placed in a scattered, or promiscuous position, around the Thoracic side of these organs; between them and the Serratus Major Anticus Muscle.

The regular branches from the Axillary Artery are six: the three which follow first are termed the External Thoracic Arteries, in contradistinction to the Internal Mammary from the Subclavian.

1. The ARTERIA THORACICA HUMERARIA, or the Humeral Thoracic, or Acromial Thoracic branch, arises from the upper and fore part of the Axillary Artery, nearly corresponding with the second Rib; it turns forwards over the upper edge of the Pectoralis Minor muscle; then descends in the interstice between the anterior margin of the Deltoid and the Clavicular fasciculus of the Pectoralis Major Muscles, being behind the Cephalic Vein (which is situated more superficially in the same interstice); during its descent, it parts into branches which are gradually distributed to the two last mentioned muscles, the Musculus Subclavius (by a recurrent branch or two), and the Capsule of the shoulder joint.

2. The ARTERIA THORACICA SUPREMA, or the Superior Thoracic branch, commences from the same part of the Axillary Artery as the Humeral Thoracic, and in most instances arises with it in one origin; it winds forwards over the superior margin of the Pectoralis Minor Muscle, a little nearer the breast than the last artery; then divides into branches which descend in a spreading course, first between the Pectoralis Minor et Major; and

subsequently in lesser divisions, through the substance of the latter, between its fasciculi, pervading it and organizing it;—in this, as a medium, it inosculates with the other External Thoracic Arteries, branches from the Internal Mammary and the Intercostals.

3. The ARTERIA THORACICA LONGA. The long Thoracic branch, usually arises a little lower than the last; its size is very varying; it passes, rather tortuously forwards and downwards along the inferior margin of the Pectoralis Minor Muscle, being behind the lower part of the Pectoralis Major; so as to come on the Serratus Major Anticus, where it is lost. It inosculates through the substance of the Pectoral Muscles with the other External Thoracic, and in the substance of the Serratus Major Anticus and Intercostal Muscles with the Internal Mammary and intercostal Arteries. In its course it gives off small branches, called *Arteria Galactoferi,* which turn round the under side of the Pectoralis Major Muscle, so as to enter the Glandular substance of the Mamma, and supply it conjointly with the Arteria Galactoferi from the Internal Mammary Artery.

4. The ARTERIA INFRA SCAPULARIS, SUBSCAPULARIS, or the INFERIOR ARTERY *of the Scapula,* a very large branch, arising from the Axillary Artery, a little lower than the three External Thoracic branches, and just corresponding to the interstice between the Subscapularis and the Teres Major Muscles: it descends obliquely back-

wards along the Inferior Costa Scapulæ, and in correspondence with the intermuscular interstice last mentioned, towards the Inferior Angle of the Scapula; it gives branches to the contiguous muscles in its course, viz., the Subscapularis Teres Major, Latissimus Dorsi, and Serratus Major Anticus; and its termination makes a very free inosculation upon the circumference of the Inferior Angle of the Scapula, with the Arteria Basios Scapulæ from the Superficial Cervical branch of the Subclavian Artery.

A large branch, called the *Arteria Dorsalis Scapulæ*, arises from the Infra-Scapulary Artery just after its origin; and turns backwards, in the interstice between the Subscapularis Muscle and the Teres Major, around the Inferior Costa, at a little distance from the Cervix Scapula; being first between the Costa and the Teres Major, and then the Costa and Teres Minor Muscles, and lying so closely upon the Costa as frequently to sulcate it by its pulsations: it next spreads into branches on the Fossa Infra-Spinata, beneath the Musculus Infra-Spinatus; which are subsequently remitted, in the form of minuter ramfications, into the substance of the musculus Infra-Spinatus;—but one leading branch ascends beneath the Acromion, and unites with the Supra-Scapulary Artery from the Subclavian.

The ARTERIA CIRCUMFLEXA POSTERIOR is a large branch, and commences from the Axillary Artery at the same point as the Infra Scapulary, frequently in a common origin with it; but sometimes much lower, from the upper part of the Brachial: it turns backwards, round the inner side of the Os Humeri, through the interstice between the Subscapularis and Teres Major Muscles; then turns outwards round the posterior side of the Os Humeri, first beneath the long head of the Triceps, then superiorly to the short head, and so comes beneath the posterior part of the Deltoid muscle (which conceals the last mentioned heads of the Triceps): it divides into branches beneath the under Aponeurotic surface of the Deltoid, which perforate its under surface, to be distributed throughout the whole of its substance. The Articular nerve runs round the back of the Os Humeri, parallel to the artery, but about a quarter of an inch above it.

The ARTERIA CIRCUMFLEXA ANTERIOR, a small branch bearing no parity with the posterior in size, usually arises a little lower than that frequently opposite to it; and turns outwards round the anterior side of the Os Humeri (corresponding to the posterior as to its course); passing behind the Coraco-Brachialis and the short head of the Biceps Flexor Cubiti; then across the Bicipital Groove, and consequently behind the Tendon of the long head of the Biceps (which the groove contains), as well as the Aponeurotic lining of the groove; then, passing superiorly to the insertion of the Pectoralis Major, it gets beneath the anterior part of the Deltoid muscle, and is lost in it.

Besides the three External Thoracic branches already described, which have with a few variations nearly the same course in every subject, there are sometimes other branches called ARTERIA THORACICA ALARIA; of various size, number, and course; but, for a general description, they may be said to arise from the Pectoral or Thoracic side of the Artery; and to course in the fat, across the Cavity of the Axilla; being partially distributed, in a promiscuous manner, to the contents of the Axilla, viz., The fat, cellular membrane, and Lymphatic Glands; and ultimately ending in the muscles, which form the boundaries of the Axilla, more especially the Pectoral Muscles.

ARTERIA BRACHIALIS,

vel HUMERALIS,

Is the continuation of the Axillary; and begins from the termination of the Axillary Artery, precisely at the inferior edge of the Teres Major muscle; or as soon as the Artery emerges from the Axilla, and gains the region of the arm; as it is passing the lower boundaries of the Axilla, or emerging from between the inferior edges of the Teres Major and Pectoralis Major muscles. It descends through the internal side of the arm, almost subcutaneously: first, on the origin of the Triceps Extensor Brevissimus, or Brachialis Externus; then on the insertion of the Coraco-Brachialis; and in the lower and longer part of the arm, on the internal side of the Brachialis Internus: It is *bounded* at its outer side, during its descent in the superior third of the arm, by the belly of the Coraco-Brachialis; and in the two inferior thirds of the arm by the internal margin of the Biceps: it then sinks into the triangular cavity at the bending of the fore-arm, on the tendon of the Brachialis Internus muscle, by the inner side of the tendon of the Biceps, and behind the expansion of that tendon called Fascia Bicipitis; becomes closed over by the contiguous bellies of the Pronator Radii Teres and the Supinator Radii Longus, and bifurcates about an inch or an inch and a half below the seat of flexion into the Radial and Cubital Arteries.

The *sheath* is the only thing that perfectly intercepts it from the Integuments at the internal aspect of the arm, and by the internal edge of the Biceps. The *concomitant organs* invested in its sheath are, the two Venæ Satellites, which are situated by its sides, and the Median nerve, which is situated before it; this first descends anteriorly and rather externally to the artery, then insensibly inclines over it in its descent, and at the lower part of the arm gets quite internally to it, and in the latter relative position descends behind the Fascia of the Biceps: sometimes there is only one vein by the side of the artery, instead of two, then called the Brachial Vein: in some instances the nerve descends behind the Artery instead of before; and frequently, when there is a high bifurcation of the Brachial Artery, the nerve descends between the two arteries. The Vena Basilica and Nervous Cutaneous Internus are concomitant organs, but are situated subcutaneously *on the inner side of the sheath.*

The branches of the Brachial Artery consist of four nominal Arteries; three of which are large, and, coming off from the internal and posterior side of the Artery, supply the internal, posterior, and outerside of the arm; and smaller muscular branches, which pass off from the outer side of the Artery, and supply the front of the arm.

1. The ARTERIA PROFUNDA MAGNA, vel PROFUNDA SUPERIOR, commences from the posterior side of the begining of the Brachial Artery, just below the insertion of the Teres Major. It glides downwards and backwards, with the beginning of the Spiral nerve, into the Trifurcation of the Triceps; i. e., between the Triceps Extensor Brevissimus (vel Brachialis Externus) and the Triceps Extensor Brevis, and consequently beneath the Triceps Extensor Longus; it then turns downwards and outwards, with the continuation of the nerve, round the posterior side of the Humerus, on a superficial sulcus upon the back of the bone, and beneath the origin of the Triceps Extensor Brevis; its continuation being considerably diminished by supplying the portions of the Triceps muscle, it emerges from beneath the outer side of the Triceps Brevis, a little below the insertion of the Deltoid muscle; descends on the External Spine of the Os Humeri, within the External Inter-muscular Ligament, and ends upon the External Condyle in ramifications that inosculate with the Recurrent Artery from the Radial.

2. The ARTERIA NUTRITIA is the chief artery of those that nourish the bone. A small branch, arising either from the upper part of the Brachial Artery, or from the last-mentioned branch, gives small ramifications to the muscles immediately about it, and then slants downwards through the Medullary Canal, to be distributed to the structure of the bone. The Medullary Canal is situated just

in the tract of the Brachial of the Artery, usually in the beginning of the Internal Spine of the bone or just by its side.

3. The ARTERIA PROFUNDA MINOR, or INFERIOR, usually arises from the middle part of the Brachial Artery, but sometimes from the beginning of the Profunda Magna. It descends obliquely inwards and backwards, on the surface of the Triceps Extensor Brevissimus, covered by the Cubital nerve; some of its most lateral contortions being seen, however, on either side of the nerve: it next glides betweeen some of the most superficial fibres of the lower part of the Triceps Extensor Brevissimus, gets into the fossa behind the Internal Condyle, and there unites with the Recurrent branch from the Ulnar Artery.

4. ARTERIA ANASTIMODICA MAGNA arises from the lower part of the Brachial Artery, about two inches above the bend of the fore-arm; usually first emerging from behind the Median nerve, it passes tortuously inwards, and rather downwards, across the Brachialis Internus muscle; then, perforating the lower part of the Internal Intermuscular Ligament, winds downwards behind the internal Condyle, and inosculates, like the Profunda Minor, with the Recurrent branch of the Ulnar.

The small Muscular or promiscuous branches chiefly arise from the outer side of the Artery, and pass outwards, almost transversely, to the Biceps and Brachialis Internus muscles.

The ARTERIES OF THE FORE-ARM.

The large Arteries of the Fore-arm consist of the *Radial*, the *Cubital*, and the *Interosseal.*

ARTERIA RADIALIS.

The *Radial* Artery commences from the bifurcation of the Brachial Artery, in the angular interstice at the bending of the Fore-arm. It passes downwards and bends rather outwards; first, anteriorly to the tendon of the Biceps Flexor Cubiti, then the insertion of the Supinator Radii Brevis, and then the insertion of the Pronator Radii Teres: upon the latter it glides out of the triangular cavity, and makes insensibly a slight turn to assume a more perpendicular direction in its descent through the Radial side of the two lower thirds of the Fore-arm; descending in succession upon the origin of the Flexor Sublimis Perforatus (where that muscle arises from the outer side of the Radius below the insertion of the Pronator Radii Teres), upon the lower part of the Flexor Longus Pollicis, and the insertion of the Pronator Quadratus. When descending in the upper part of the Fore-arm, it is in a deep intermuscular situation; its external side is covered by the Supinator Radii Longus; its internal side, first, by the Pronator Radii Teres, and still lower by the Flexor Carpi Radialis. In the lower part of the

Fore-arm its position gradually becomes superficial and inter-tendinous; for the Supinator Radii Longus and Flexor Carpi Radialis, becoming tendinous,—recede from it; so that it is here unprotected by muscle, and is situated between the tendons of these latter muscles, covered only by the Common Integuments and fascia, against which it is felt beating by the Radial side of the tendon of the last named muscle, as it supported on the lower part of the Flexor Longus Pollicis and insertion of the Pronator Quadratus muscles. The continuation of the Artery turns round the radial side of the carpus, over the back of the Os Trapezium, and beneath the Extensor tendons of the Thumb; and at the Interosseal space between the Base of the Metacarpal bone of the Thumb and Index finger, it turns forwards into the palm of the hand, between the Abductor and Prior Indicis muscles: having entered the deep-seated part of the palm (behind the Abductor Pollicis muscle), it curves transversely inwards across the Bases of the Metacarpal bones and Internal Interosseal muscles, forming the *Deep-seated Palmar Arch;* the convex side of which is towards the fingers, and concave side towards the Carpus; the beginning of the arch being behind the Abductor Pollicis, its continuation, perforating the origin of that muscle, remains concealed behind the Flexor tendons and Lumbricales muscles of the Ring and Little Fingers; and near the Metacarpal bone of the little finger it terminates by a continuity of vessel with the Deep-seated Palmar branch of the

Ulnar Artery, the most considerable and direct communication between the Radial and Ulnar Arteries.

The *neighbouring organs* are—its two Venæ Satellites, in close connection with its sides: the Superficial branch of the Spiral nerve descends parallel to it, but about half an inch more outwardly than it, between the edge of the Supinator Radii Longus and the Extensor Carpi Radialis Longior; and at the lower part of the Fore-arm the Volar twig from the same branch, and the termination of the External Cutaneous nerve, run closely to it.

The principal branches of the Artery are eight.

I. The ARTERIA RECURRENS commences from the Radial Artery soon after its origin; and proceeds upwards, and rather outwards, over the External Condyle, in the deep interstice between the Supinator Radii Longus and the Brachialis Internus; running retrograde, and contiguous to the Spiral nerve in the same interstice; and is distributed on the External Condyle in branches that communicate with the Arteria Profunda Magna Arteriæ Brachialis.

The Radial Artery gives off *muscular branches* in its progress, which supply the muscles forming the Radial side of the Fore-arm, and the Artery which ascends into the Medullary Canal of the Radius.

2. The ARTERIA SUPERFICIALIS VOLÆ MANUS arises from the Radial Artery about two or three inches above the wrist. It descends ob-

liquely forwards, over the Ligamentum Carpi Annulare Anticum by the Radial side of the tendon of the Flexor Carpi Radialis, and supplies in promiscuous branches the muscles of the Ball of the Thumb, and by a continuation of some of these, the outer side of the Thumb; one branch, by the Palmar side of the Ball of the Thumb, inosculates with the termination of the Superficial Palmar Arch of the Ulnar Artery.

3. ARTERIA CARPEA, the Carpal branch, arises from the Radial Artery as soon as it gets upon the back of the Carpus, passes transversely inwards across the back of the Carpus beneath the Extensor tendons, inosculating with a similar branch from the Ulnar Artery, called Arteria Dorsalis; whereby, in connection with that, it forms the *Arcus Dorsalis Superficialis Manus.* The Carpal branch gives off the *Arteriæ Interossiæ Externæ:* these are three small branches: an individual one of these passing downwards on one of the External Interosseal muscles, supplying them; and at the roots of the fingers they end in small ramifications which form a minute vascular network, which is expanded throughout the tendinous Fasciæ on the backs of the Phalanges of the Fingers.

4. The ARTERIA DORSALIS POLLICIS, a small branch given off just before the Artery passes between the Abductor and Prior Indicis muscles: it proceeds along the cubital side of the back of the Metacarpal bone of the Thumb; and is distributed in small ramifications through the tendinous Fascia

upon the back of the Thumb, that is the united expansions of the Extensor tendons of the Thumb.

5. The ARTERIA DORSALIS INDICIS arises at the same point as the last, and sometimes by a common beginning with it, passes along the radial side of the Metacarpal bone of the Index, and supplies the fascia of the tendons on the radial side of the back of that Finger.

Lastly, the Radial Artery, having passed between the Abductor and Prior Indicis into the Palm of the hand, trifurcates into the Arteria Magna Pollicis, the Arteria Radialis Indicis, and the Arteria Palmaris Profunda. This trifurcation is bounded behind by the Abductor Indicis, which conceals it at the back of the hand; and before by the Abductor Pollicis, which conceals it in the Palm.

6. The ARTERIA MAGNA POLLICIS arises from the trifurcation, passes along the palmar side of the Metacarpal bone of the Thumb, between the Abductor Indicis and Abductor Pollicis; then emerges from between the lower edges of the two muscles, and subsequently descends along the internal side of the Thumb, and supplies it.

7. The ARTERIA RADIALIS INDICIS passes along the Metacarpal bone of the Index finger, between the two last mentioned muscles; and then along the outer or radial side of the Index finger, imperceptibly diminishing.

8. The ARTERIA PALMARIS PROFUNDA is the Deep-seated Palmar branch which has been already

described as the continued Artery, being the largest branch, and forming the Deep-seated Palmar Arch. The convexity of this Arch gives off the three *Palmar Interosseal Arteries*, which descend individually as small undivided Arteries, along the surface of one of the Internal Interosseal muscles, being concealed behind the Lumbricales muscles: at the roots of the Fingers they turn forwards, and end abruptly in the bifurcations of the Digital Arteries, forming as many inosculations between the Radial and Cubital Arteries.

ARTERIA CUBITALIS, OR ULNARIS.

The Cubital Artery commences, like the last, from the bifurcation of the Brachial Artery: it passes off more obliquely than the Radial, but is much larger, and therefore seems like the continuation of the Brachial. It bends obliquely inwards and downwards behind the mass of Flexor muscles that arise from the Internal Condyle, viz., the Pronator Teres, Flexor Carpi Radialis, Palmaris Longus, and Flexor Sublimis Perforatus (the latter supporting the former muscles); and it is supported, while behind these muscles, on the Flexor Profundus Perforans: by this diagonal descent it meets with the Cubital nerve, at the lower part of the superior third of the Fore-arm; and runs perpendicularly downwards through the two lower thirds of the Internal side of the Fore-arm, upon the continuation of the Flexor Profundus Perforans, covered by the united margins of the Flexor Sublimis Perforatus and the Flexor Carpi Ulnaris; the Cubital nerve keeping in close adhesion to its Cubital side, and covered by the edge of the last-named muscle: immediately above the wrist it emerges from between the tendinous continuations of these muscles, and mounts over the Ligamentum Carpi Annulare Anticum, by the Radial side of the Os Subrotundum; the continuation of the Cubital nerve being situated between the artery and the bone, and in some degree behind them: the artery then sinks into the Palm of the hand, and, turning outwards, it forms the *superficial Palmar Arch*, which crosses the Flexor Tendons, Lumbricales muscles, and the branches of the Median and Cubital nerves, nearly opposite to the middle of the Metacarpal bones, and behind the Palmar Fascia: it becomes gradually wasted by giving off the Digital Arteries, towards the internal side of the ball of the thumb, to a very small size, and inosculates with the superficial Volar branch, Arteria Magna Pollicis, and Arteria Radialis Indicis from the Radial artery.

The artery has no nerve concomitant with it in the upper third of the Fore-arm, but it is crossed at its origin by the descent of the Median nerve. The concomitant organs are, its two Venæ Satellites; and in the two lower thirds of the Fore-arm, the Cubital nerve. The Branches given off from the Cubital artery are the Interosseal, and the eight following smaller arteries.

1. The ARTERIA RECURRENS ULNARIS passes upwards and inwards from the beginning of the artery, in a retrograde course, by the Cubital nerve (previously to the nerve coming in contact with the Cubital artery), between the Flexor Profundus Perforans and the Flexor Sublimis Perforatus; then ascending behind the Internal Condyle, perforates the origin of the Flexor Carpi

Ulnaris, and unites with the Arteria Anastimodica Magna and Profunda Minor from the Brachial artery.

The Arteria Interrossea Communis will be described separately, as it ranks among the larger Arteries.

The Ulnar Artery gives off small promiscuous branches in its descent, supplying the Cubital side of the Fore-arm.

2. The ARTERIA DORSALIS arises from the Cubital artery, generally within two or three inches above the Anterior Annular Ligament, and descends obliquely backwards behind the tendon of the Flexor Carpi Ulnaris, to the Cubital side of the Carpus, where it inosculates with the Carpal branch from the Radial artery, forming along with it the *Arcus Dorsalis Superficialis Manus*, already mentioned.

3. As soon as the Cubital Artery enters the Palm, it gives off the ARTERIA PALMARIS PROFUNDA—the deep-seated Palmar branch, which turns directly backwards with the deep-seated Palmar branch from the Cubital nerve, by the side of the Flexor Brevis Minimi Digiti Manus, and is continuous behind the Flexor Tendons of the little finger with the termination of the deep-seated Palmar Arch of the Radial artery :—this branch is frequently concealed by the position of the Cubital artery.

4. The Cubital Artery next gives off the ARTE-

RIA VOLARIS MINIMI DIGITI MANUS. This is a small branch which arises just before the commencement of the superficial Palmar Arch, often closely by the side of the deep-seated Palmar branch, but sometimes from its beginning; it proceeds downwards upon the muscles forming the Cubital side of the palm of the hand, then along the same side of the little finger, and is gradually spent in its course. The superficial Palmar Arch gives origin to,

5. The ARTERIA DIGITALIS PRIMA, which arising from the commencement of the Arch, descends upon the belly of the Lumbricalis muscle that is between the Flexor tendons of the little and ring finger, and behind the Palmar Fascia (with a division of the Cubital nerve): it emerges from between the divisions of the Palmar Fascia, opposite to the space between the roots of the two fingers, and bifurcates into a branch supplying the radial side of the little finger, and another branch supplying the Cubital side of the ring finger.

6. The ARTERIA DIGITALIS SECUNDA arises from the middle part of the Arch, passes downwards upon the Lumbricalis muscle between the Flexor tendons of the ring and middle fingers, and behind the Palmar Fascia, with a branch of the Median nerve; and emerging from beneath the slips of the Palmar Fascia passing to the two last-named fingers (along with the bifid continuation of the nerve), bifurcates, between the roots of the

two fingers into a branch supplying the Radial side of the ring finger, and another supplying the Cubital side of the middle finger.

7. The ARTERIA DIGITALIS TERTIA arises nearer the termination of the Arch, and descends like the others, on the Lumbricalis muscle intermediate to the Flexor tendons of the Middle and Index Fingers, with a division of the Median nerve, and behind the Palmar Fascia: then emerging from beneath the Palmar Fascia, bifurcates to supply the outer side of the middle finger and the Internal side of the Index. The subdivisions of these Arteries upon the fingers are accompanied by the subdivisions of the nerves: the Digital nerves bifurcate in the Palm before they pass from beneath the Palmar Fascia;—the Arteries bifurcate subsequently to passing from beneath the Fascia, and between the roots of the fingers.

8. The ARTERIA COMMUNICANS, the small extremity of the Arch which inosculates with the branches of the Radial Artery already mentioned.

The ARTERIA INTEROSSEA COMMUNIS arises from the beginning of the Cubital Artery just subsequently to the Recurrent branch. It is a very short stump, that faces downwards and inwards between the Flexor Profundus Perforans and Flexor Sublimis Perforatus, and forms a *common origin to four branches;* two of which course through the front of the Fore-arm, before the Interosseal Ligament, and two through the back of the Fore-arm behind the Ligament.

1. The ARTERIA ANTERIOR. This is the largest branch, and generally considered to be the continuation of the Interosseal trunk, or the proper Interosseal Artery; inclining backwards from its origin between the Profundus Perforans and Flexor Longus Pollicis. It is seen to descend upon the middle of the Interosseal Ligament, between the bellies of the Flexor Profundus Perforans and the Flexor Longus Pollicis; and passing behind the Pronator Quadratus, bifurcates — into a small *Volar branch*, which descends behind the Pronator Quadratus; and then behind the Ligamentum Carpi Annulare Anticum, posteriorly to the continuations of the Flexor tendons, into the Palm of the Hand, and inosculates with the deep-seated Palmar Arch of the Radial Artery; and the larger *Dorsal branch*, which is the continued artery, perforates the lower part of the Interosseal Ligament behind the Pronator Quadratus muscle, then passes over the posterior side of the articulation between the Radius and Ulna, and terminates in the superficial Dorsal Arch.

2. The ARTERIA MEDIANA is usually very small, but subject to such a variability in this respect as occasionally to equal in size either the Radial or Ulnar, and sometimes supersedes the latter: bending forwards from the common origin, it adheres to the Median nerve, descends with it against a superficial sulcus in the under surface of the Flexor Sublimis Perforatus, and generally becomes spent at the lower part of the Fore-arm

to the Median nerve and in minute muscular ramifications: sometimes it is larger, and, retaining a continued form, passes behind the Annular Ligament, with the tendons of the Flexor Sublimis, and ends in the superficial Palmar Arch.

ARTERIES ARISING FROM THE DESCENDING PORTION OF THE THORACIC AORTA.

These consist of three sets; namely, the Arteria Intercostales Inferiores, which pass to the Intercostal Muscles, Extensors of the Trunk, Diaphragm, and Abdominal Muscles; the Arteriæ Bronchiales; and the Arteriæ Œsophageæ.

1. ARTERIÆ INTERCOSTALES INFERIORES, consist of eight, nine, or ten pair; which arise from the posterior and lateral part of the Aorta Thoracica, and, turning upwards and backwards, curve obliquely across the bodies of the Dorsal Vertebræ, so as to gain the Intercostal spaces: they then pass forwards round the circle of the Thorax, in the Intercostal spaces, and in the Intercostal Grooves which are situated internally to the inferior acute margin of the Ribs; being at first, as they are between the Vertebræ and the angles of the Rib, between the Musculi Intercostales Externi and the Pleura Costalis; afterwards, passing the angles, and becoming fairly lodged in the Intercostal Groove, they are between the Intercostales Externi et Interni. Each artery, as it is coursing forwards, in the latter position, gives off a branch downwards, which passes along the superior margin of the Rib next below, and becomes, like the principal continuation of the artery, promiscuously

distributed through the muscles at the anterior part of the parietes of the Thorax (more especially to the Intercostal muscles). They inosculate with the Internal Mammary, and with the lowest of the divisions of the Superior Intercostal Artery from the Subclavian (by a branch given from that division of the superior Intercostal Artery, which descends across the Thoracic side of the neck of the Rib next below it, to join the commencement of the highest Intercostal Artery from the Aorta), and with the external Thoracic Arteries from the axillary, (which are expressly dispersed to the Pectoral Muscles). The five, or six lower pair of Intercostal Arteries are unexpended in the corresponding Intercostal spaces; but are continued forwards and downwards, so as to perforate the origin of the larger muscle of the Diaphragm, giving branches inwards into the substance of the Diaphragm, which inosculate with the proper Diaphragmatic Arteries: they then emerge from behind the cartilaginous margin of the Thorax, formed by the united cartilages of the false Ribs, and pass between the layers of the abdominal muscles, for the most part like the corresponding Intercostal nerves, between the Obliquus Internus and Transversalis Abdominalis, to which they are promiscuously dispersed, and inosculate through the medium of the Abdominal muscles, with the Internal Epigastric and Lumbar Arteries.

2. The ARTERIÆ BRONCHIALES are very small, as they are only for nourishing the membra-

nous structure of the Lung. Generally there are three Arteries; but frequently there are four.

The ARTERIA BRONCHIALIS DEXTRA arises from the fore and right side of the upper part of the Aorta Thoracica, and passes forwards, and to the right side (in the Posterior Mediastinum), behind the Œsophagus; sometimes it arises from the highest of the Aortic Intercostal Arteries on the right side, and then it passes forwards by the right side of the Œsophagus: it is afterwards continued out of the Posterior Mediastinum, into the right Pulmonary Ligament, coursing between the Laminæ of the Ligamentum Pulmonale Latum Dextrum, along with the Right Pulmonary Vessels and right Bronchus; then perforates with the Bronchus the root of the Lung, and becomes dispersed promiscuously through its substance.

The ARTERIA BRONCHIALIS SINISTRA arises from the fore and left side of the Aorta Thoracica, and passes forwards, and to the left side, towards the left Lung; first, out of the Posterior Mediastinum; and then between the laminæ of the Left Pulmonary Ligament, along with the left Pulmonary vessels and left Bronchus; then perforates along with these the root of the left Lung, and is dispersed in promiscuous ramifications to its substance.

The ARTERIA BRONCHIALIS COMMUNIS arises from the anterior part of the Thoracic Aorta, and, passing forwards for a very short distance in a single form, bifurcates: the one branch, which passes forwards, and to the left side, out of the Posterior Mediastinum; then, through the left Pulmonary Ligament along with the Arteria Bronchialis Sinistra, perforates, like that, the root of the left Lung, and is dispersed with it promiscuously in the substance of the Lung: the other branch passes forwards, and to the right side, first, as it is in the Posterior Mediastinum, behind the Œsophagus; it afterwards passes between the Laminæ of the right Pulmonary Ligament, with the corresponding Pulmonary Arteries and Bronchus, to the root of the right Lung, and, like the Bronchial Artery, proper to the right Lung, is lost in its substance.

The ARTERIA BRONCHIALIS INFERIOR sometimes exists, which arises from the Aorta below the more regular ones, and takes an indefinite course to one or another (generally to the right), or sometimes to both of the Lungs. The Bronchial Arteries give ramifications to supply the Pleuræ forming the Posterior Mediastinum and the Pulmonary Ligament.

3. The ARTERIA ŒSOPHAGEÆ, are small Arteries, which may be from four to ten in number, that arise from the anterior part of the Thoracic Aorta, and, passing forwards, ramify in a tortuous manner, about the Œsophagus, so as to encircle it by anastomosing branches, and then pass into its muscular substance.

AORTA ABDOMINALIS.*

The branches arising from the Abdominal portion of the descending Aorta, commonly called the Aorta Abdominalis, consist of three Azygos Arteries, passing to the Loose or Abdominal Viscera; and five pairs, which supply the fixed or Extra-Abdominal Viscera and the parietes of the Abdomen.

The first arteries that arise from the Abdominal Aorta are,—the two ARTERIÆ DIAPHRAGMATICÆ INFERIORES—the first pair. These arise from the anterior part of the Aorta behind the Ligamentum Arcuatum Aortæ, and before it fairly becomes the Abdominal Aorta, or gains the region of the Abdomen. They bend downwards beneath the Ligamentum Arcuatum Aortæ; then slant upwards and outwards obliquely in front of the two Crura of the Diaphragm, and behind the Margo Obtusus of the Liver and the Ligamentum Coronarium; they afterwards divide into primary branches upon the under surface of the larger muscle of the Diaphragm, which are continued into its substance in minuter and promiscuous ramifications, that inosculate with branches which pass inwards into the substance of the Diaphragm from the lower Intercostal Arteries, as the latter are emerging from between the cartilages of the false Ribs, and piercing the origin of the Diaphragm to reach the Abdominal muscles;—besides which, they inosculate with the proper Superior Diaphragmatic branches and the Phrenic branch from the Internal Mammaries. Sometimes one of the Inferior Diaphragmatic Arteries comes off from the Hepatic; sometimes one is much larger than the other, and they may arise by a common trunk which afterwards bifurcates.

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* For the position of the Abdominal Aorta, see page 2.

1. AZYGOS ARTERY.—The next branch is the ARTERIA CELIACA, a large Azygos Artery, which arises from just below the Inferior Diaphragmatic, and as soon as the Aorta gets completely below the Ligamentum Arcuatum Aortæ;—it is a short thick stump, which is, at the farthest, not more than three-eighths of an inch in length. It arises from the anterior part of the Aorta Abdominalis, and projecting forwards, trifurcates into branches which pass off in a radiation from it as from a common centre; on which account it is termed the AXIS ARTERIÆ CELIACÆ. The Celiac trunk or Axis is *bounded* superiorly by the Ligamentum Arcuatum Aortæ and the Margo Obtusus of the Liver; inferiorly, by the upper edge of the Pancreas; laterally, by the Crura of the Diaphragm, and the two Semilunar Ganglia of the Splanchnic

branches of the Sympathetici Maximi—which branches descend through the Foramen Posticum by the side of the Aorta, and then terminate by the side of the Celiac Artery and upon the Crura of Diaphragm in the two Semilunar Ganglia ;—anteriorly it is bounded immediately, or in a fixed way, by the Sac of the Peritoneum which is connected with it by cellular membranea, as it lines the posterior side of the Abdomen ; more anteriorly and distantly still, it is bounded by the Lesser Curvature of the Stomach, and the small Omentum. All the arteries from the Celiac Axis come off with a peculiar bend.

1st. The one of the trifurcation, which is the smallest, and most to the left, is the ARTERIA CORONARIA VENTRICULI. It arises from the Celiac Artery and bends upwards, and to the left side, so as to become attached to the right side of the Cardiac Orifice of the Stomach ; it then passes along the Lesser Curvature of the Stomach in the attachment of the small Omentum, and being almost exhausted by branches, ends upon the Pyloric Orifice of the stomach. At the Cardiac Orifice of the stomach it gives off the *Arteria Cardiaca*, the Cardiac branch, which passes round the termination of the Œsophagus, or the Cardiac Orifice : this gives branches downwards, which supply the contiguous part of the stomach ; and branches upwards, which ascend through the substance of the Œsophagus, and are continued in that through the Foramen Sinistrum Diaphragmatis, so as to enter the Thorax, and in the substance of the Œsophagus to inosculate with the Œsophageal branches from the Thoracic Aorta. As the Coronary Artery passes along the lesser Curvature, the chief part of the artery is expended in giving downwards the *Arteria Transversæ*, Transverse branches, that descend across the anterior and posterior surface of the stomach, between the Peritoneal and Muscular coats, gradually becoming diminished as they approach towards the larger Curvature,—by giving inwards minute and innumerable ramifications through the muscular and cellular coats, which form the organization of the Mucous coat, and more especially by their secreting extremities, the internal Villous or secreting surface of the coat,—they give outwards, also, colourless exhalants to the Peritoneal coat, which throw out the exhalation upon the Peritoneal surface of the stomach.

The termination of the artery is the *Arteria Pylorica*, which is distributed upon the upper side of the Pylorus.

2d. The Arteria Splenica is the largest of the three branches of the Celiac in the adult subject, being as large as a goose-quill ; but the Hepatic is the largest in the Fœtus. The Splenis Artery first makes a short bend downwards, to get behind the upper edge of the Pancreas ; and then passes outwards in a tortuous manner towards the left side and towards the Spleen, being situated in a superficial Sulcus behind the upper edge of the Pancreas ; it passes behind the continuation of the

Peritoneum which unites the left extremity of the Pancreas to the lower part of the Spleen anteriorly to the upper part of the left Kidney, where it divides into branches which pass in a tortuous manner towards the Spleen, perforate the Fissure Longitudinalis, and there ramify very tortuously through its substance, so as to form a great part of its vascular substance, terminating either by forming continuous inflected canals with the beginnings of the veins, or else in minute membranous cells which are supposed by many to exist in the Spleen, and to form an inter-continuation between the arteries and the veins; the minute branches ramifying about the cells, and then opening them by orifices, from which cells also the veins are continuous. As soon as the Splenic Artery gets behind the upper edge of the Pancreas, it gives off the *Arteria Princeps Pancreatica*, which is the largest of the Pancreatic branches that arise from the Splenic, and descends into the substance of the Pancreas:—in the subsequent part of its course behind the Pancreas, it gives off smaller branches, called *Pancreaticæ Accessoriæ*, which descend into its substance. It also gives off, in the same manner, four or five branches called *Arteriæ Gastricæ Posteriores*, which pass forwards to the part of the posterior surface of the stomach, that is contiguous to the Lesser Curvature. Then the principal branches forming the continued artery give off, just before their entrance into the Fissura Longitudinalis of the Spleen, four or five branches called *Vasæ*

Breviæ, which are reflected backwards from the Fissura Longitudinalis in the fold of Peritoneum uniting the Fissura Longitudinalis to the left extremity of the stomach, and supply promiscuously the left extremity, or Cul de Sac. Then from one of the undermost of the branches produced by the division of the Splenic Artery, just before it plunges into the Spleen, it gives off the largest, and therefore the most important, branch of those that bear a distinguishing name, called the *Arteria Gastro-Epiploica Sinistra;* this descends along the left side of the larger Curvature of the Stomach, being in the adhesion of the left side of the large Omentum, and ends on the middle of the larger Curvature by inosculating with the Right Gastro-Epiploic Artery from the Hepatic: it supplies both the Stomach and Omentum in its progress;—giving *Gastric* branches upwards, which ascend across the anterior and posterior surface of the stomach of a limited distance, and communicate with those from the Coronary Artery; and *Epiploic* branches, which pass downwards through the left side of the large Omentum, and these are the largest belonging to the Omentum Magus.

3. The ARTERIA HEPATICA COMMUNIS. This is the largest of the three primary branches from the Celiac in the Fœtus, in correspondence with the enormous size of the Liver at that time. It bends towards the right side, being attached by the Peritoneum to the upper margin of the Pancreas; then turns upwards behind the commence-

ment of the Duodenum, so as to enter the Capsule of Glisson; it ascends through the anterior and left side of the Capsule, and before it reaches the Portæ of the Liver it divides into the *Arteria Hepatica Dextra et Sinistra,* which ascend into the substance of the right and left Lobes, by passing through the Porta; the right being the largest. Their larger ramifications are held in connection with the branches of the Vena Portæ Hepaticæ, by the cellular Thecæ of the latter, while their more minute divisions are dispersed every where through the substance of the Liver; the terminations of these communicating with the Vena Portæ Hepaticæ in the Acici, and forming a continued canal (like the Vena Portæ Hepaticæ) with the commencements of the Venæ Cavæ Hepaticæ.

The first branch regularly given off from the Hepatic Artery is the *Arteria Gastro-epiploica Dextra, Gastro-duodenalis,* or *Duodeno-gastrica.* It arises from the Hepatic behind the beginning of the Duodenum; it first passes beneath the beginning of the Duodenum, supplying that; then along the right side of the larger curvature of the Stomach, in the attachment of the large Omentum, giving branches to each; and on the middle of the larger curvature it ends in inosculating with the Gastro-epiploica Sinistra. This artery gives off, (as it is descending contiguous to the Pylorus, commencement of the Duodenum, and right extremity of the Pancreas)—a *Pyloric branch* to the Pylorus;—*Duodenal branches,* which descend upon the commencement of the Duodenum;—the *Duodeno-pancreatic branch*, which passes backwards and bifurcates, part passing into the right extremity of the Pancreas, and part to the Duodenum;—and the *Transverse Pancreatic branch* which runs transversely through the right extremity of the Pancreas. As the artery is passing along the greater curvature of the Stomach in the Omentum, it gives off *Gastric branches* which pass upwards, and *Epiploic branches* which pass downwards.

The *Arteria Pylorica Superior*, a branch arising from the *trunk* of the Hepatic just before it enters the Capsule of Glisson, and distributed to the Pylorus.

The bifurcation of the Common Hepatic forms the Arteria Hepatica Dextra, and the Arteria Hepatica Sinistra.

The Arteria Hepatica Dextra gives off a small branch to the cervix of the Gall-bladder, called the *Arteria Fellea*; which divides at the Cervix into two branches, called the *Arteriæ Cyticæ Gemellæ*, which pass along the sides of the Gall-bladder towards the Fundus, between the peritoneal and fibrous coats, and are expended in its structure after the same manner as the Gastric Arteries are to the Stomach, and the arteries of all hollow membranous viscera.

DIAGRAM II.

A PLAN OF THE PRINCIPAL BRANCHES OF THE CELIAC ARTERY.

⁂ The names of the Arterial Trunks are in Small Capitals; those of the secondary set, in Italics; and those of the third series in Small Text.

1. 1. The Crura Diaphragmatis.

2. The Foramen Posticum Diaphragmatis.

3. 3. The AORTA ABDOMINALIS.

4. 4. The ARTERIÆ ILIACÆ COMMUNES.

5. 5. The ARTERIA SACRA MEDIA.

6. 6. Outline of the distended Cul de Sac of the Stomach.

7. Outline of the Duodenum.

8. Outline of the distended Gall-bladder.

9. Outline of the Spleen.

10. Outline of the Œsophagus.

11. 11. ARTERIÆ DIAPHRAGMATICÆ INFERIORES.

12. AXIS ARTERIÆ CELIACÆ.

13. *Arteria Coronaria Ventriculi.*

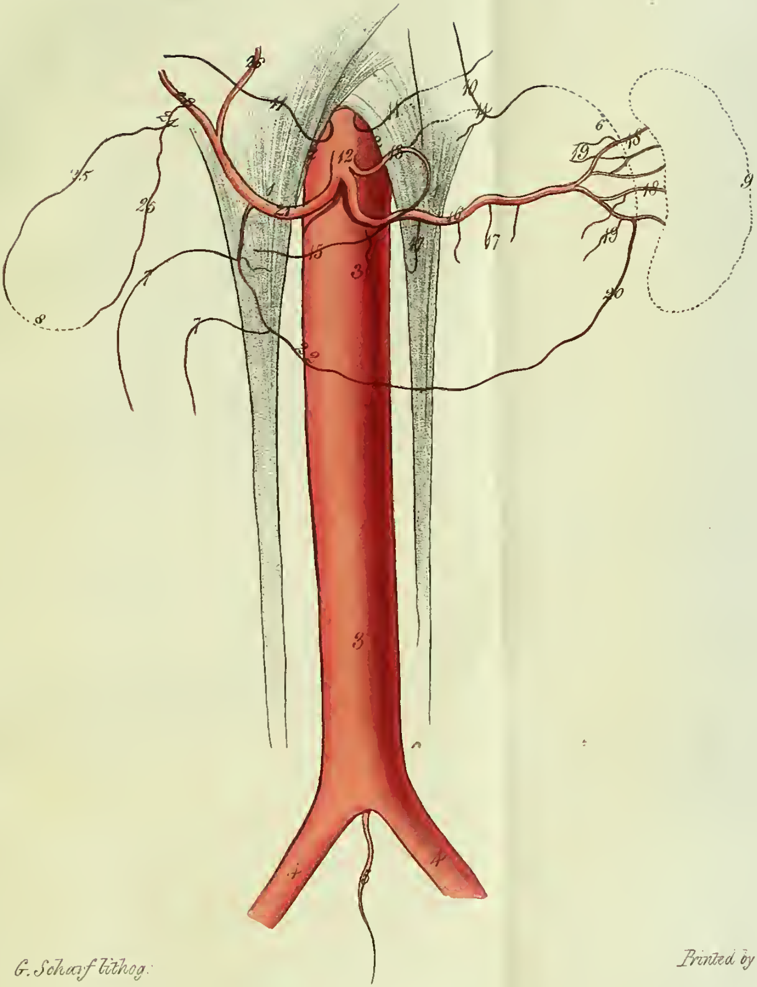
14. The Cardiac Branch.

15. The Pyloric Branch.

16. *Arteria Splenica.*

17. 17. Pancreatic Branches.

Diag 2.



G. Scharf lithog:

Printed by C. Hullmandel.

G. D. Dermott. Delt.

18. 18. Splenic Branches.

19. 19. Vasa Brevia.

20. Arteria Gastro-Epiploica Sinistra.

21. *Arteria Hepatica Communis.*

22. Arteria Duodeno-Gastrica, vel Gastro-Epiploica Dextra.

23. Arteria Fellea.

24. Arteria Cystici Gemelli.

25. 25. Arteria Hepatica Dextra.

29. Arteria Hepatica Dextra Sinistra.

2. Azygos Artery.—The Arteria Mesenterica Superiora arises from the fore part of the Aorta, immediately below the Celiac Artery. It first descends behind the Pancreas, so as to emerge from beneath its lower edge (so that its commencement is concealed by the Pancreas, the latter seeming to intercept this artery from the trunk of the Celiac); then descending behind the root of the Transverse Meso-colon, it enters between the Laminæ of the Mesentery, and descends through its root across the Transverse portion of the Duodenum, bending in its descent towards the right Iliac Region, so as to form an arch: the concavity of this arch faces upwards, and to the right side, and the convexity downwards and to the right side. The concavity of this arch produces the following three branches, which have particular names, and supply all that part of the Colon in the right side of the Abdomen.—The *Arteria Colica Media* arises from the concave side of the Artery, just after it enters the root of the Mesentery, and passes upwards and towards the right side, involved in the Meso-colon, to supply the Hepatic Flexure, the right side of the Transverse arch, and the upper part of the ascending portion of the Colon,—by dividing against the Hepatic Flexura into two branches; one bending upwards along the right side of the Transverse Arch in the attachment of the Meso-colon to that, and inosculating upon the middle of the arch with the highest branch of the Inferior Mesenteric Artery; the other branch bends downwards along

the descending portion of the Colon, and inosculates with the ascending branch of the next artery.

The *Arteria Colica Dextra* arises from the concave side of the Superior Mesenteric Artery, as it is in the root of the Mesentery, or is sometimes a branch of the last described artery; it passes transversely towards the right side behind the Internal or Vertebral Lamina of the ascending Meso-colon (which lamina, in lining the back of the Abdomen, forms the continuity of the Peritoneum transversely between the Mesentery and ascending Meso-colon); and then the artery parts into two branches to supply the ascending portion of the Colon: one branch, passing upwards upon the ascending portion of the Colon, inosculates and forms an arch with the descending branch of the Colica Media; the other branch, bending in a similar way downwards upon the ascending portion of the Colon, inosculates with the next.

The *Arteria Ilio-colica* seems not unfrequently to be the continuation of the great arch of the artery, supplying the Intestines in the right Iliac Region, viz., the lower part of the Ilium, Cæcum, Appendix Vermiformis Cæci, and the beginning of the ascending portion of the Colon: the branches which supply the latter inosculate with the descending branch of the Arteria Colica Dextra; and those which are upon the Ilium with the branches which immediately follow.

The *Arteriæ Intestinales.*—These form the principal part of the artery; arise from the convex side of the arch; and are between twelve and twenty in number. As these large branches pass forwards between the Laminæ of the Mesentery, each bifurcates, and the branches bending sideways inosculate by continuous extremities, so as to form one continuous line of inosculating arches: from these arches smaller arteries pass forwards, and, bifurcating, form a lesser or a secondary series of arches, and by the subsequent divisions, a succession of smaller arches are formed which seem to form a plexus of small arches: from the last of these arches small straight arteries pass forwards to the convolutions of the Intestines; then coming against the concave side of the convolutions of the Intestines, and into the attachment of the Mesentery to the Intestines, each divides into two small branches, which encircle the circumference of the Intestine transversely, passing between the Peritoneal and muscular coats, furnishing the exhalant vessels to the Peritoneal coat, and minute ramifications to the internal coats.

3. AZYGOS ARTERY.—The ARTERIA MESENTERICA INFERIOR, is only one third the size of the Superior Mesenteric; for it only supplies the left side of the transverse arch of the Colon, the Splenic Flexure, descending portion, Sigmoid Flexure, and Rectum. It arises from the fore and left side of the Aorta Abdominalis, half way between the origin of the Superior Mesenteric and he bifurcation of the Aorta, and about an inch

and a half or two inches above the bifurcation; it comes off in a peculiar bend from the Aorta, turning downwards and towards the left side, anteriorly to the Psoas Magnus muscle, and behind the Internal Lamina of the descending Meso-colon (which adheres to the thin continuation of the Fascia Iliaca, covering the Psoas Magnus by the cellular membrane that connects the Internal Lamina of the descending Meso-colon, as the Peritoneal lining of the Abdomen to the Fascia); then getting anteriorly to the Ureter, or thereabouts, it trifurcates into the following branches:—

The *Arteria Colica Ascendens Anastimodica* passes upwards, and towards the left side, between the Laminæ of the Meso-colon to supply the Splenic Flexure, and continuous parts of the Transverse Arch and descending portions of Colon, dividing opposite to the Splenic Flexure into two branches: one turns upwards along the left side of the Transverse Arch, and unites with the ascending branch of the Colica Media from the Superior Mesenteric Artery; whereby these two highest branches of the two Mesenteric Arteries form a continued arch, extending along the Transverse Arch of the Colon in the attachment of the Meso-colon to the Intestine, called *Circulus Arteriosus Abdominalis:* the other branch turns downwards, upon the beginning of the descending portion of the Colon, and unites with the following.

The *Arteria Colica Sinistra,* seu *Transversa* passes from the trifurcation towards the left side behind the Internal Lamina of the descending Meso-colon, and bifurcates: one branch turns upwards along the descending portion of the Colon, and inosculates in an arch with the descending branch of the last mentioned; the other descends on the Sigmoid Flexure, and inosculates with the highest branch of the next artery.

The *Arteria Hemorrhoidalis Interna* is the largest branch, and, appearing to be the continuation of the artery, it turns downwards over the Arteria Iliaca Communis into the cavity of the Pelvis (like the Ureter, and the Spermatic Artery in the female); it then descends behind the Rectum, between the two Laminæ of the Meso-rectum, and spreads into ramifications as it descends upon the posterior surface of the Rectum, which supply the posterior side of the Rectum—inosculating by ramifications, which are reflected backwards from the Rectum with the Arteria Sacra Media, and Arteriæ Sacræ Laterales, upon the anterior surface of the Sacrum; and by some of its branches, which extend forwards towards the sides of the Rectum, it inosculates with the two Arteriæ Hemorrhoidales Mediæ from the Internal Iliacs; which supply the lower and lateral part of the Rectum; and also, through the medium of these with the Arteriæ Hemorrhoidales Externi from the Internal Pudic Arteries, which supply the lowest part of the anterior side of the Rectum and verge of the Anus; the leading division being continued downwards upon the back of the Rectum, in the form of a continued branch to within three inches of the Anus before it becomes lost.

The three large Arteries of the Aorta last described are Azygos, because the viscera which they supply are Azygos.

2d Pair.—The ARTERIÆ SUPRA-RENALES are two slender branches arising from the sides of the Aorta, laterally, to the origin of the Superior Mesenteric, and pass outwards to supply the Supra Renal Capsules, along with branches remitted from the Inferior Diaphragmatic, and from the Renal Arteries.

3d Pair.—ARTERIÆ RENALES, or EMULGENTES, are two large arteries that arise from the sides of the Aorta Abdominalis about a quarter of an inch below the Supra Renal and the origin of the Superior Mesenteric Arteries: each proceeds obliquely outwards, downwards, and rather backwards, first anteriorly to the Tendinous Crus of the Diaphragm; and then, bending over the belly of the Psoas Magnus muscle, it gradually sinks into the fat which imbeds the Kidney within the Lumbar Region of the Abdomen, and approaching the Sinus of the Kidney, divides into its primary branches which assume rather a contorted form, and pierce the Sinus (the Renal Artery holds a position superiorly to the other organs within the Sinus) :—here the artery gives off small filamentous-like branches to the fat, Capsula Supra-renalis, and in a particular manner to the Membrane Propria of the Kidney, in which latter part they have a star-like distribution dividing into ramifications, which radiate as from so many centres of division.

The continuation of the main branches of the Renal Artery, after piercing the Sinus, ramify through the substance of the Kidney, and chiefly through the Cortical part, very minutely, where they are said to terminate in small convoluted extremities termed Cryptæ, which communicate freely with the commencement of the Tubuli Uriniferi, and the beginnings of the Renal Vein.

The right Renal Artery is longer than the left, in consequence of the Aorta being on the left side of the Spine; and it passes behind the Inferior Vena Cava, which is situated on the Spine, by the right side of the Aorta. There are frequently great irregularities both in the origins, course, and number of the Renal Arteries; but not in their mode of distribution through the Kidneys.

4th Pair.—The ARTERIÆ SPERMATICÆ. The two Spermatic Arteries arise, when regular, from the fore and lateral part of the Aorta, about three quarters of an inch below the origin of the Renal Arteries; they are of a very slender, long, and tortuous form. They pass obliquely downwards and outwards; the right first passes obliquely over the Vena Cava Inferior; then each descends obliquely over the Psoas Magnus muscle and behind the Peritoneum, being closely attached to the posterior surface of the Peritoneum by the cellular membrane which connects the Peritoneum to the Fascia immediately covering the Psoas Magnus muscle;—and here it also crosses in front of the Ureter, or passes betwixt the Ureter and the Peritoneum; but the Ureter is also, like the artery, so closely adherent to the Peritoneum, that it follows it, or keeps in close attachment to the Peritoneum when it is stripped from the Parietes of the Abdomen, or, i. e., the Fascia covering the Psoas Magnus muscle: it then emerges from behind the Peritoneum in its progress towards the Internal Abdominal Ring, and receives from the cellular surface of the Peritoneum a process of cellular membrane, which unites it at the Internal Abdominal Ring (where all the parts of the Cord meet) with the other organs of the Cord into a process of vessels, which descends within the Abdominal Canal ensheathed within the Fascia Canalis: the artery then emerges from the External Abdominal Ring, and descends through the continuation of this Spermatic process of vessels (now properly called the Spermatic Cord), being enclosed with the other organs of the Cord in the Cremaster muscle and Fascia Spermatica, and covered more superficially by the Fascia Superficialis and the Common Integuments; and, becoming increasingly tortuous in its descent, its convolutions are embraced by the veins of the Spermatic Plexus, and help to make the base of the Spermatic Cord (the cord being rather of the conical shape, becoming smaller towards the External Abdominal Ring): just above the testicle the artery divides into a number of tortuous branches, which form by their convolutions a sort of Coronary distribution upon the posterior part of the Testicle and Epidydymis, and are partly expended in remitting ramifications into the substance of the Epidydymis; but the main continuations of the branches inclining forwards with the veins upon the surface of Testicle, perforate the Tunica Albuginea, and are continuous in the substance of the Testicle with the commencement of the Spermatic Veins; and also it is supposed with the Tubuli Seminiferi. In the female, the Spermatic Arteries pass, as in the male, obliquely across the Psoas Magnus muscle, and then incline from behind the Peritoneum at the back of the Abdomen, and turn over the bifurcation of the Common Iliac Arteries into the cavity of the Pelvis; then, inclining inwards between the two Laminæ of the Ligamenta Lata Uteri, give ramifications to the contents of the Ligamenta Lata; viz., the Ovaria, Fimbria and Fallopian Tubes, and are then continued into the Fundus Uteri; and, supplying the substance of the Fundus and the upper part of the Uterus, inosculate in the substance of these parts with the Uterine branch from the Internal Iliac Artery.

5th set of Pairs.—The ARTERIÆ LUMBALES. Just as the Aorta within the Thorax gives off branches to the Intercostal spaces termed Intercostal Arteries, so, as it is at the back of the Abdomen, it gives off corresponding branches which supply the muscular substance of the Loins, and are termed the Lumbar Arteries; sometimes consisting of four, sometimes five pairs. These arise from the posterior and lateral part of the Aorta Abdominalis; they bend backwards over the sides of the bodies of the Lumbar Vertebræ (the upper ones passing, like the lowest Dorsal, behind the Crura Diaphragmatis, the middle-most through the Crura, and the lowest before the origins of the Crura), and then sink behind the Psoas Magnus muscle, to which they are partially distributed as well as to the Quadratus Lumborum, and the posterior portions of the Abdominal muscles:—they supply also the Vertebræ, and give small branches inwards through the Foramina Intervertebralia, which supply the membranes, and likewise, in some measure, the substance, of the Medulla Spinalis:—they inosculate with the inferior Intercostal, Internal Mammary, Epigastric, and Ilio-Lumbar Arteries:—frequently, a branch of the latter, passing the Crita Ilii, supplies the place of the fifth Lumbar Artery.

The ARTERIA SACRA MEDIA arises from the termination of the Aorta Abdominalis (commonly called the bifurcation of the Aorta); descends over the fifth Lumbar Vertebra, the Promontory of the Sacrum, and then along the middle of the anterior concave surface of the Sacrum as low as the Os Coccygis:—it inosculates with the Internal Hemorrhoidal and the lateral Sacral Arteries.

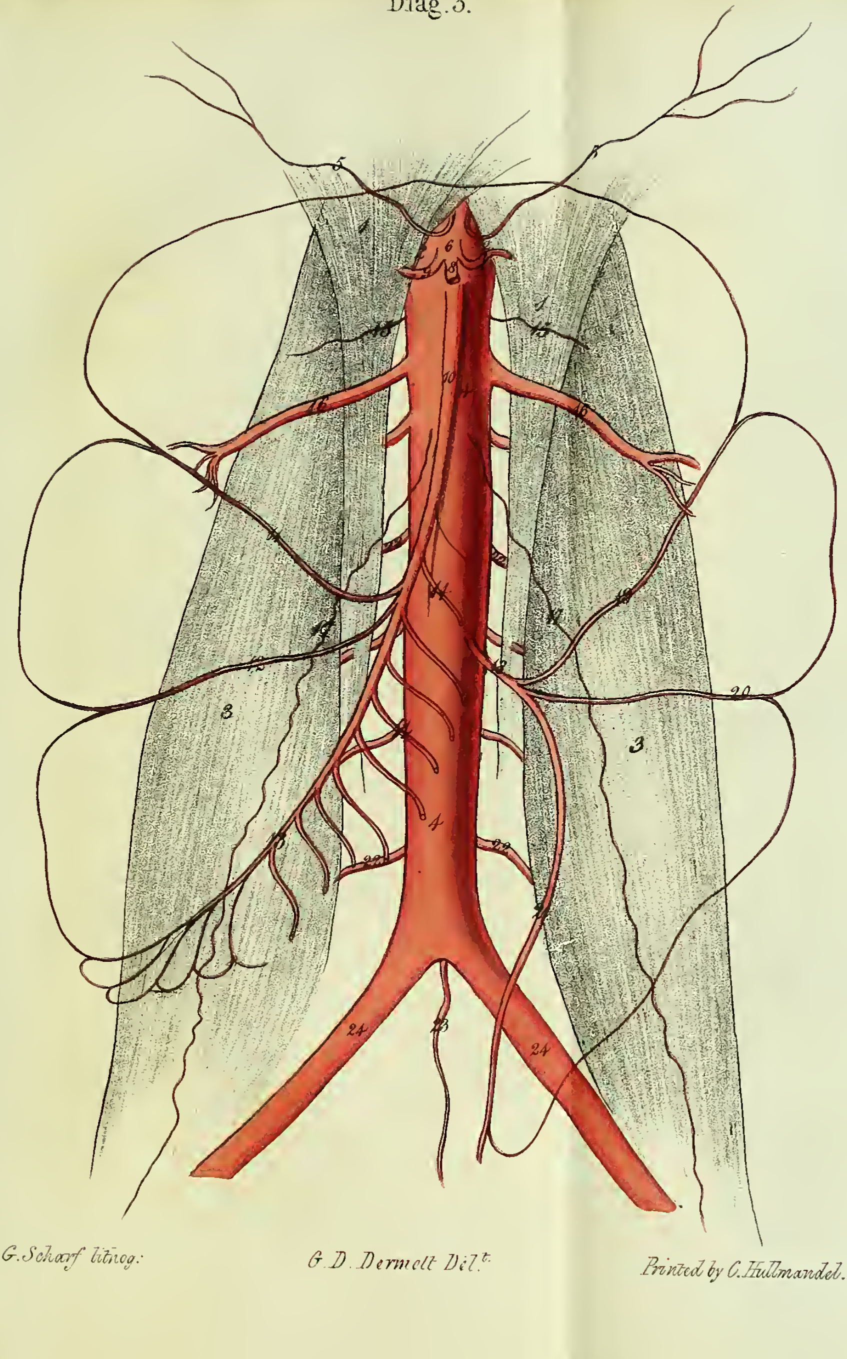
DIAGRAM III.

A PLAN TO ILLUSTRATE THE ARTERIES GIVEN OFF FROM THE ABDOMINAL AORTA.

⁂ The names of the Arterial Trunks, and primitive arteries given off from the Aorta, are in Roman Capitals; and those of the second series in Italics.

1. 1. The Crura Diaphragmatis.
2. The Foramen Posticum Diaphragmatis.
3. 3. The Psoas Magnus.
4. 4. THE AORTA ABDOMINALIS.
5. 5. THE ARTERIÆ DIAPHRAGMATICÆ.
6. AXIS ARTERIÆ CELIACÆ.
7. *Arteria Coronaria Ventriculi.*
8. *Arteria Splenica.*
9. *Arteria Hepatica Communis.*
10. ARTERIA MESENTERICA SUPERIOR.
11. *Arteria Colica Media.*
12. *Arteria Colica Dextra.*
13. *Arteria Ilio-colica.*
14, 14. *Arteriæ Intestinales.*
15. 15. ARTERIÆ SUPRÆ RENALES.
16. 16. ARTERIÆ RENALES.
17. 17. ARTERIÆ SPERMATICÆ.
18. ARTERIA MESENTERICA INFERIOR.
19. *Arteria Colica Ascendens.*
20. *Arteria Colica Transversa Anastimodica.*
21. *Arteria Hæmorrhoidalis seu Sinistra. media.*
22. 22. 22. 22. ARTERIÆ LUMBALES.
23. ARTERIA SACRA MEDIA.
24. 24. ARTERIÆ ILIACÆ COMMUNES.

Diag. 3.



G. Scharf lithog: G. D. Dermott Delt. Printed by C. Hullmandel.

ARTERIA ILIACA COMMUNIS.

The common Iliac Artery arises from the bifurcation* of the Aorta Abdominalis; passes obliquely downwards and outwards, anteriorly to the side of the fifth Lumbar Vertebra; and then trifurcates opposite to the upper part of the Sacro-iliac Symphisis, about two inches below its origin, and just by the inner side of the Psoas Magnus muscle, into the Internal and External Iliac Arteries.

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* I call this bifurcation in compliasance to custom, although more accurately speaking, it is a trifurcation.

ARTERIA ILIACA INTERNA.

The Internal Iliac Artery arises from the bifurcation of the Common Iliac; passes downwards, and rather backwards, through the posterior part of the cavity of the Pelvis, anteriorly to the Pyriformis muscle, Sacral Plexus of nerves, and Sacro-iliac Symphisis, and behind the Cul de Sac of the Peritoneum which lines the Pelvis; about two inches below its origin it divides into many branches; the *four largest* of these pass out of the cavity of the Pelvis; viz., the Obturator artery, passing forwards; the Internal Pudic and Ischiatic, which arise from the termination of the Artery, and passing downwards form its bifurcation; and the Gluteal, passing backwards.

The ARTERIA OBTURATORIA arises from the anterior side of the Internal Iliac; passes forwards in the side of the Pelvis, laterally to the Cul de Sac of the Peritoneum, and opposite to the Linea Ilio-pectinea, being in a cellular hollow formed beneath the External Iliac vessels along with the Obturator Nerve; it emerges with the latter from the Pelvis through the Sinus Orbturatorius, that is above the Obturator Ligament, and the origins of the Obturator muscles; and then ramifies between the Pectinalis and the Obturator Externus muscles; on the surface of the latter inosculating with the anterior or ascending division of the Internal Circumflex Artery from the Arteria Femoralis Profunda.

The Arteria Ischiatica. The Ischiatic and the Internal Pudic Arteries pass downwards, from the termination of the Artery, laterally to each other, in front of the Pyriformis muscle, and emerge through the under part of the large Ischiatic Notch, from beneath the under side of the Pyriformis muscle; where they usually cross each other: the Ischiatic, which was before the most internal, crossing over the Internal Pudic, and getting the most external; is afterwards continued downwards, in an arborescent form, along with the trunk of the Ischiatic nerve, over the Rotator muscles of the thigh; viz., the Geminus Superior, Obturator Internus, Geminus Inferior, and Quadratus Femoris,—and is distributed in a great degree to the Gluteus Maximus covering these muscles; the remaining branches afterwards descend between the long head of the Biceps and the Triceps Adductor Magnus, and inosculate with the termination of the External and Internal Circumflex, and the first Perforating branch from the Arteria Femoralis Profunda. It gives off the *Arteriæ Coccygeæ*, small branches, which perforate the External Sacro-Ischiatic Ligament, and supply the substance of the Coccygeus muscle. A small tortuous branch comes off from the termination of the Artery, called *Arteria Comes Nervi Ischiatici* which supplies the substance of the Ischiatic nerve as low as the Ham.

The Arteria Pudica Interna emerges from the under part of the Ischiatic Notch, and from beneath the under side of the Pyriformis muscle;

then turns round the superficial side of the Spinous ~~and~~ Process of the Ischium ; re-gains or re-enters the Pelvis through the upper part of the Lesser Ischiatic Notch, above the Obturator Internus muscle. It is then continued forwards and downwards (according to the position in which the Pelvis is naturally situated), obliquely across the surface of the Obturator Internus muscle, being involved in the substance of the Obturator Fascia which covers the muscle : it then gets deeply by the side of the Tuberosity of the Ischium (being here about an inch and a half from the superficial surface of the Tuberosity, and at least two inches below the superficial surface of the Perineum) : it afterwards ascends behind the Ascending Ramus of the Os Ischium, and the Descending Ramus of the Os Pubis, posteriorly to the Crus et Erector Penis, and ultimately a little below the Symphisis, and behind the continuation of the Crus Penis with the Corpus Cavernosum Penis it bifurcates into a Dorsal and a deep branch. The first remarkable branch given off from the Internal Pudic is the *Arteria Hemorrhoidalis Externa*, which is a small branch arising from it by the inner side of the Tuberosity of the Ischium, which passes inwards to be distributed to the Sphincter Ani and verge of the Anus. A little further forwards it gives off the *Arteria Superficialis Perinei*, which passes inwards and forwards, and is chiefly distributed in the fat and cellular Membrane situated superficially to the interstice between the Erector Penis and Accelerator Urinæ : its small extremity is subsequently extended forwards, and lost upon the ligamentous sheath covering the under side of the commencement of the Corpus Cavernosum Penis.

The *Arteria Transversalis Perinei* arises near the two latter, sometimes from the last, and passing inwards across the Perineum, beneath the anterior edge of the Transversalis Perinei, it is expended in ramifications to the muscles covering and surrounding the Bulb.

Arteria Transversalis Penis, or the *Transverse Artery of the Bulb*, arises near the Superficial Perineal Artery; passes inwards across the Perineum so as to be but barely covered beneath the Transversalis Perinei muscle; and perforates the Bulb, so as to be distributed in the Corpus Spongiosum of that and the cylindrical continuation of the Urethra.

The termination of the Internal Pudic Artery divides (as has been already mentioned) a little below the Symphisis, and posteriorly to the continuation of the Crus Penis with the Corpus Caverniosum Penis into the two following:—

The *Arteria Dorsalis Penis*, which passes forwards between the under side of the Symphisis and the root of the Penis, by perforating the Ligamentum Suspensorium: it is afterwards extended forwards in the substance of the Cellular sheath upon the back of the Corpus Cavernosum Penis, laterally to the Vena Magna Ipsius Penis, and gradually spent by a superficial distribution towards the Glans.

The *Arteria Profundissima Penis* perforates the commencement of the Corpus Cavernosum Penis (by which it is concealed), and is distributed by minute ramifications, which have a fine filamentous-like form, throughout the tissue of the reticulated Membrane which forms the spongy substance of the Corpus Cavernosum Penis, so as to form a Rete Mirabile; the minute extremities of the Artery being probably continuous with the commencement of the corresponding veins, and also communicating by orifices with the cavities of the cells peculiar to the Corpus Cavernosum.

The ARTERIA GLUTEA. The Gluteal Artery arises from the posterior side of the Internal Iliac Artery (its commencement being frequently concealed by the position of the Iliac Artery; but sometimes it is so large as to appear like a continuation of the Iliac Artery), and turns backwards between the large Sacral nerves, and then through the upper of the large Ischiatic Notch, above the upper side of the Pyriformis muscle; then, winding round upon the edge of the Dorsum Ilii, it gets between the Gluteus Medius and Pyriformis, where it parts into three divisions which produce as many sets of branches, viz. :—

The *Arteria Superficialis*, which is the most superficial division, and consists of branches which pass forwards and ramify throughout the upper or Iliac half of the substance of the Gluteus Maximus muscle; some of the minute ramifications emerge from the superficial surface of the muscle, and supply the fat of the Nates superficially to the Gluteus Maximus; and other ramifications which supply promiscuously that part of the origin of the Gluteus Maximus which is on the back of the Sacrum, communicate through the Medium of that muscle with the termination of the Arteriæ Sacræ Lateralis:

The *Arteria Profunda* is the middlemost and largest division of branches, which, passing forwards, spread widely; the upper branches being on the Dorsum Ilii, and immersed in the origin of the Gluteus Medius; and the lower ones being between the Gluteus Medius and Minimus; the middlemost branch, being generally the largest, courses forwards on the Linea Semicircularis (frequently sulcating it), and so encircles the upper part of the Gluteus Minimus muscle, forming a line of distinction between that and the origin of the Gluteus Medius; and this and all the other branches of the deep division are gradually expended in promiscuous ramifications within the substance of the Gluteus Medius muscle:

The *Arteria Profundissima* is the smallest and deepest division, and is frequently only a slender single branch, which passes forwards (from the trifurcation of the Gluteal Artery) across the lower part of the Dorsum Ilii, a little superiorly to the Dorsum Acetabuli, and consequently beneath the middle part of the Gluteus Minimus muscle, in the substance of which it is lost; and inosculates in the anterior part of the muscle with the ascending branch of the External Circumflex Artery, from the Arteria Femoralis Profunda.

The lesser branches from the Internal Iliac Artery are much more numerous, and are distributed to the muscles and viscera within the cavity of the Pelvis: the first of these that may be described is:—

The ARTERIA ILIO-LUMBALIS, which arises from the posterior side of the Internal Iliac Artery, and slants upwards and outwards behind the belly of the Psoas Magnus muscle; then ramifies widely and superficially through the substance of the Iliacus Internus muscle: one branch, extending upwards, runs forwards for a certain distance on the posterior part of the Crista Ilii, so as frequently to supersede the last Lumbar, and inosculates with the Circumflexus Crista Ilii of the External Iliac Artery.

The ARTERIÆ SACRÆ LATERALES arise from the internal and posterior side of the Internal Iliac Artery, frequently in the form of four separate branches; sometimes, however, in three branches; at other times in the form of a double, or even a single origin, which afterwards subdivides: they are continued inwards through the Anterior Sacral Foramina, but previously inosculate, by small ramifications, in the Membrana Propria, upon the anterior surface of the Sacrum, with lateral ramifications from the Arteria Sacra Media; they are then continued into the Specus, and supply the Cauda Equina: the extremities of some of the ramifications perforate the ligamentous Membranes, filling up the Posterior Sacral Foramina, and supply the flesh on the back of the Sacrum, consisting of the Gluteus Maximus and the strong Extensors of the Loins; communicating also with promiscuous ramifications of the Superficial Division of the Gluteal Artery, in the origin of Gluteus Maximus muscle.

The order in which the following branches are given is, with one exception, according to the *general position of the parts within the Pelvis;* beginning at the back of the Pelvis with the most posterior, and then, in succession, taking those that are situated more anteriorly, and which is in fact also the natural order.

The ARTERIA HEMORRHOIDALIS MEDIA arises from the Internal Iliac Artery, and passes downwards and inwards to be distributed to the lower half of the side of the Rectum; inosculating towards the back of the Rectum with the large Artery supplying the back, viz., the Arteria Hemorrhoidalis Interna (which is the termination of the Inferior Mesenteric from the Aorta); and at the anterior and inferior part of the Rectum, towards the Anus, with the Arteria Hemorrhoidis Externa from the Internal Pudic Artery.

The ARTERIA SPERMATICA is a small branch, which passes forwards, so as to become attached to the Vas Deferens in the Male subject, or the Ligamentum Rotundum Uteri in the Female; and then descends upon the surface of one or other of these through the Internal Abdominal Ring, the Abdominal Canal, and the External Abdominal

Ring, and supplies the substance of the Vas Deferens as low as the Testicle, or the Ligamentum Rotundum Uteri as low as the Mons Veneris.

The viscera placed in front of the Rectum, in the female, are the Uterus and the Vagina. The Internal Iliac Artery gives off the ARTERIA UTERINA, which passes downwards and inwards to the Cervix of the Uterus; then winds round the Cervix of the Uterus, and as it is winding round the Cervix of the Uterus, it gives downwards the *Arteria Vaginalis*, to be distributed to the upper and lateral part of the Vagina. The continuation of the Uterine Artery then ascends through the side of the Uterus so superficially as only to obtain a complete covering by the External Peritoneal Coat; and being gradually distributed to the substance of the lower part of the Uterus, towards the Fundus, it inosculates with the Spermatic Artery from the Aorta which supplies the Fundus.

The ARTERIA VESICALIS IMUS HALLERI, or VESICÆ INFERIOR, is a small slender Artery, which usually arises from the lower and fore part of the Internal Iliac Artery, and passes downwards, forwards, and inwards, to be distributed into promiscuous branches upon the neck of the Bladder, Prostate Gland, Vesiculæ Seminales, and Membranous portions of the Vasa Deferentia.

The ARTERIA UMBILICALIS is a very small branch which passes forwards from the anterior side of the Internal Iliac Artery, towards the side of the Bladder, where it is in structural continuation with the beginning of the Ligamentum Vesicæ Laterale, the impervious remains of the Umbilical Artery in the Fœtal stage; its *pervious* continuation being here also spent in the form of small ramifications, called the *Arteriæ Vesicæ Superiores* (in contra-distinction to the Arteria Vesicalis Imus Halleri) to the Fundus, or upper part of the Bladder.

The Internal Iliac Artery, in the Fœtus, passes downwards and backwards into the cavity of the Pelvis, and gives off the branches which have been here described in the adult subject (these, however, are then very small in comparison with the vessels of other parts, which is in correspondence with the small size or non-developed condition of the Legs and the lower part of the Body): the unexpended continuation of the trunk then assumes the name of the UMBILICAL ARTERY, and turns forwards in an arch by the side of the Bladder, and afterwards ascends in front of the anterior side of the Peritoneal Sac (between that, consequently, and the anterior Parietes of the Abdomen formed by the Recti muscles and their Sheaths) obliquely upwards and forwards towards the Umbilicus, converging towards the opposite Artery; and is then continued through the Umbilicus, in juxta-position with the opposite Umbilical Artery and the Umbilical Vein (which passes from the Umbilicus upwards through the Ligamentum Teres to the Liver), and also the termination of the Urachus: these fill up the aperture of the Fœtal Umbilicus: the Urachus tapers and terminates in the commencment of the Umbili-

Cord; but the continuations of the Umbilical Arteries and vein are twisted together in contortions which run parallel to each other, and, being united by fine cellular tissue, which contains a gelatinous fluid, they constitute the substance of the Funis, or Cord, which is covered by a general sheath formed by the continuation of the Uterine Membranes.

When the Fœtal circulation subsides, the Posterior side of the Arch, strictly speaking, the Iliac Artery, enlarges; and along with this the branches given off from it, enlarge; while the middle continuation of the Arch, diminishes into the Umbilical branch, so as only to carry a small proportion of blood adequate to supply the Fundus of the Bladder; and the anterior continuation of the Arch between the side of the Bladder and the Umbilicus decays into the impervious cellular Cord called the Ligamentum Vesicæ Laterale.

ARTERIA ILIACA EXTERNA.

The External Iliac Artery, arising from the bifurcation of the common Iliac Artery, passes forwards, downwards, and a little outwards; being in the first part of its course closely by the internal side of the Psoas, and afterwards supported upon its surface; then, in this position, emerging from beneath Poupart's Ligament, it gains the region of the Thigh, and so becomes the common Femoral Artery. The External Iliac vein, near Poupart's Ligament, is situated closely by the internal side of the vein, and towards the back of the Pelvis gets behind or under the artery. These vessels are enclosed in one sheath, which is formed by the Fascia Iliaca: this, as it is descending round the internal side of the Psoas Magnus muscle, from Poupart's Ligament to the Linea Ilio-pectinea; meets the external Iliac vessels and splits in two Laminæ, so as to surround them and constitute the sheath; being reunited into one Lamina again under the vessels at the Linea Ilio-pectinea: it is this which binds the vessels against the surface of the muscle.

The branches given off from this artery consist of very small ones to the set of external Inguinal Lymphatic Glands; — and the two following, which are large.

The Arteria Epigastrica Interna arises from the internal side of the external Iliac Artery, just previous to its termination and behind Poupart's Ligament: it first makes a little turn downwards beneath the Peritoneum, then passes obliquely upwards and forwards in front of the Peritoneum, in the substance of the Fascia Transversalis, passing behind the lower parts of the muscles forming the Parietes of the Abdominal canal, as well as the contents of the canal; viz., first, behind the lower part of the Obliquus Internus, then by the internal or posterior side of the Spermatic process of vessels, and afterwards behind the lower edge of the Transversales Abdominis: then, passing behind the Linea Semilunaris, it necessarily comes in contact with the lower part of the posterior surface of the Rectus Abdominis (for at this situation there is a breach or absence of its sheath); it subsequently ascends in a sulcus within the posterior surface of the Rectus muscle; by the sulcus gradually deepening, it is let into the substance of the muscle, so as to ramify through it; and in the upper part of the Rectus muscle it makes free inosculations with the termination of the internal Mammary Artery.

As the internal Epigastric Artery crosses the internal side of the Abdominal canal, it gives off the *Arteria Spermatica*, a small Spermatic branch which descends with the Spermatic cord through the external Abdominal ring towards the Testicle, supplying the Cremaster muscle, and being lost in it. There are, therefore, three Spermatic Arteries passing through the external Abdominal Ring in the male subject; viz., the Spermatic Artery from the Aorta belonging to the Testicle; the Spermatic Artery from the internal Iliac, supplying the Vas Deferens; and the Spermatic branch of the Internal Epigastric for the Cremaster muscle. There are two small Spermatic Arteries passing through the external Abdominal Ring in the female; *viz.*, that which supplies the Ligamentum Rotundum Uteri (in place of the Vas Deferens), and that which supplies the Cremastic muscle; for although the Cremaster muscle is so extremely slight and pallid as to be generally indistinct, or even not discernable, yet still it exists, and may be seen in very muscular and stout females, and is also supplied by an analogous artery to that which supplies the Cremaster in the male subject.

The artery, as it is sinking into the posterior surface of the Rectus, and is nearly parallel with the Umbilicus, gives off an *Umbilical branch*, which advances towards the Umbilicus, and becomes spent in the Rectus near the Umbilicus; and the *Mammary branch*, which is the termination of the continued artery, and inosculates with the internal Mammary.

The ARTERIA CIRCUMFLEXA CRISTA ILII arises from the outer side of the termination of the External Iliac Artery, usually a very little lower than the Internal Epigastric Artery; it passes obliquely upwards and outwards behind Poupart's

Ligament, through the medium of the Fascia Iliaca ; it then passes backwards upon the anterior part of the Crista Ilii, first through the Transversales Abdominalis, then between the Transversales Abdominis and the Obliquus Internus ; and on the back of the Crista it joins the termination of the Arteria Ilio-Lumbalis. As the Artery passes the Anterior Superior Spinous Process, or just afterwards, it gives off rather a large *muscular branch*, which passes upwards and forwards between the Transversalis and the Obliquus Internus Abdominis muscle, towards the Umbilicus, and as it approaches towards the Linea Semilunaris, it becomes dispersed.

ARTERIA FEMORALIS COMMUNIS.

The Common Femoral Artery begins, as the continuation of the External Iliac Artery, beneath Poupart's Ligament; it passes down on the Psoas Magnus muscle, generally for about an inch or an inch and a half (but sometimes for not more than half an inch), and then bifurcates into the Arteria Femoralis Superficialis and the Arteria Femoralis Profunda; sometimes this bifurcation is formed by the termination of the External Iliac Artery beneath Poupart's Ligament, and then there is no Common Femoral Artery. This artery, as it is on the Psoas Magnus muscle, is situated in the groin, just midway between the Anterior Superior Spinous process and the Symphisis Pubis, or about three inches from each, and about half an inch nearer to the Tuberosity or Angle of the Os Pubis than to the Anterior Superior Spinous process.

Concomitant Organs. The common Femoral vein is situated closely by the Internal side of the Common Femoral Artery, and on the united sides of the Psoas Magnus and Iliacus Internus. It is invested in the same cellular sheath as the artery, but intercepted from actual contact with the artery by a Septum of the Sheath, through the medium of which, however, it coheres with the artery. The Anterior Crural nerve is not strictly concomitant, but is situated about half an inch more outwardly and more deeply than the artery, sunk deep in the interstice between the sides of the Psoas Magnus and the Iliacus Internus. The artery and these organs are covered by the Fascia Lata Femoris, the Fascia Superficialis, and the Common Integuments ; so that it is situated very superficially.

This is merely the trunk to the large Arteries of the Thigh, Leg, and Foot, and so that it gives off but very small branches to supply the parts immediately covering and surrounding it: the following may be nominally distinguished:

The ARTERIA EPIGASTRICA EXTERNA, a small Artery arising from the upper and fore part of the common Femoral Artery, just below Poupart's Ligament; it ascends anteriorly to Poupart's Ligament, and the tendon of the External Oblique Muscle, in the substance of the Fascia Superficialis, and, branching in its ascent, supplies the Fascia Superficialis and the common Integuments upon the lower part of the Abdomen, or upon the tendon of the External Oblique muscle.

The two *External Pudic Arteries*, called the ARTERIA PUDICA EXTERNA SUPERIOR, and the ARTERIA PUDICA EXTERNA INFERIOR, arises from the Internal side of the common Femoral Artery; one generally passes through the External Crural ring, the other usually perforates the Fascia Lata Femoris, just below the position of the Ring; they are afterwards continued inwards across the Groin, through the Fascia Superficialis, afterwards across the Spermatic Cord in the male subject, (within the continuation of the Fascia Superficialis); the superior being distributed to the Integuments, Fat and Cellular Membrane at the root of the Penis, and the Inferior to the Integuments forming the upper and fore part of the Scrotum: but in the female they cross the Ligamentum Rotundum Uteri, instead of the Spermatic cord, and the Superior Artery is distributed to the Fat, Cellular Membrane and Integuments of the Mons Veneris; the Inferior Artery to the same structure, forming the fore part of the corresponding Labium Pudendi.

There is very frequently only one External Iliac Artery; and often the two come off in one origin.

The other remissions from the common Femoral Artery, are but small ramifications, and therefore, unworthy to be mentioned.

ARTERIA FEMORALIS SUPERFICIALIS.

The Superficial Femoral Artery; but, properly speaking, the Artery passing through the Thigh to supply the Leg and Foot. It is a large Artery that descends nearly in a line with the common Femoral Artery, and therefore seems to be its continuation. It arises from the bifurcation of the common Femoral Artery, and passes downwards, rather backwards and inwards, through the internal side of the Thigh, inclining in its descent gradually from the Groin to the ham. It first descends in front of the Pectinalis muscle; afterwards in front of the interstice between the lower edge of the Pectinalis and the upper edge of the Triceps Adductor Longus (which is in correspondence with a part of the Triceps Adductor Brevis); then in front of the insertion of the Triceps Adductor Longus, and subsequently upon about an inch of the tendon of the Triceps Adductor Magnus; lastly, it perforates the tendon of the Triceps Adductor Magnus, enters the ham, and becomes the *Popliteal Artery.*

Boundaries to the Artery.

The Artery, during its descent, is bounded externally, first, by the upper part of the Rectus Femoris, and still lower (for its two lower thirds), by the origin of the Vastus Internus: internally and posteriorly it is bounded by the layers of Adductor Muscles, in front of which, I have stated that it descends; viz. the Pectinalis, the Triceps Adductor Longus et Magnus; and anteriorly, or superficially, it is bounded, in the middle third of the Thigh, by the Sartorius.

Above the middle third, the Artery is situated in a deep triangular hollow, bounded internally by the Pectoralis; externally, by the upper part of the Rectus Femoris; and anteriorly and inferiorly by the Sartorius: here it is only covered by the common Integuments, Fascia Superficialis and the Fascia Lata Femoris. In the middle third of the Thigh, as it is behind the Sartorius muscle, it is contained in a strong sheath, called the *Canalis Tricepitis:* the superficial side of this sheath is formed by a remission of tendinous fibres given off from the origin of the Vastus Internus (by the outer side of the Artery), and by another remission of tendinous fibres given off from the tendon of the Triceps Adductor Longus (by the internal side of the Artery); these two remissions intersect over the Artery; so as to form a ligamentous stratum, which is the superficial side of the sheath, and which is flatly covered by the Sartorius muscle: the posterior or deeper side of the sheath, is formed by the meeting of the origin of the Vastus Internus and the tendon of the Triceps Adductor Longus, behind the artery at the Linea Aspera.

heath

The contents of the Tricipital Canal are the concomitant organs to the artery; viz., the superficial Femoral Vein, which ascends behind the lower two-thirds of the artery in the back of the sheath, and gradually inclining forwards, gets by the inner side of the beginning of the artery; the Nervus Sphenus descends, in the sheath, upon the outer side of the artery, till it makes a very gradual inclination inwards, so as to cross the lower part of the artery; again, situated on the fore part of the sheath, and immediately beneath the edge of the Sartorius muscle, is the Anterior Cutaneous branch of the Crural nerve.

The superficial Femoral Artery gives off no remarkable or regular branches but one; namely, the ARTERIA ANASTIMODICA MAGNA, which arises from the lower and anterior part of the artery, about three inches above the Internal Condyle. It perforates the lower part of the Tricipital Canal, and passes downwards and forwards tortuously through the lower part of the Vastus Internus muscle, partially supplying it; then, its unspent continuation, emerging from the belly of the Vastus, is continued into the tendinous expansion of the Vastus, ramifies in that; and in the expansion upon the fore part of the knee joint, which is formed by the union of the tendons of the four Externor muscles, it inosculates with the articular branches from the Popliteal Artery, the descending division of the External Circumflex branch from the Arteria Femoralis Profunda, and the recurrent branch from the Anterior Tibial Artery.

ARTERIA FEMORALIS PROFUNDA.

The deep Femoral Artery is that which, properly speaking, belongs to the thigh, because it is distributed to it. It arises from the bifurcation of the Arteria Femoralis Communis, passes downwards, and rather backwards, behind the upper part of the Arteria Femoralis Superficialis, and anteriorly to the insertion of the Pectinalis muscles; then bifurcates about two inches below its origin into its terminating branches. The deep Femoral vein is by its internal side.

The primary branches forming the distribution of this artery, are the four following:—

The Arteria Circumflexa Interna, which arises from the inner side of the beginning of the Arteria Femoralis Profunda, behind the lower part of the common Femoral Vein; it immediately bends backwards in the Interstice, between the Psoas Magnus and Illiacus Internus muscles; then gets behind the Pectinalis, and between the Pectinalis and the Obturator Externus muscles, where it parts into divisions; one, which is the *Anterior* or smaller division, ascends betweeen the Pectinalis and the Obturator (upon the surface of the latter), and inosculates near the Obturator Sinus with the termination of the Obturator Artery: from this latter branch a small artery is given off near its inosculation, called the *articular branch*, which passes outwards concomitantly with another corresponding articular branch from the termination of the Obturator, behind the Psoas Magnus muscle; then through the Cotyloid Fissure, and beneath the Ligamentum Transversale, so as to be distributed to the Synovial structures, and parts within the joint; and some of the more extending ramifications pervade the Ligamentum Teres, and reach the head of the Os Femoris. The posterior and larger division seems like the continued artery, and passes backwards round the Internal side of the Cervix of the Os Femoris with the Obturator Externus muscle, gets to the posterior side of the Cervix, where it is covered, like the tendon of the Obturator Externus muscle, by the Quadratus Femoris; it then parts into branches, many of which emerge from beneath the Quadratus muscle, and inosculate with the Ischiatic Artery, high in the back of the thigh, between the upper parts of the long head of the Biceps and the Triceps Adductor Magnus.

The ARTERIA CIRCUMFLEXA EXTERNA arises from the outer side of the Arteria Femoralis Profunda, a little lower than the origin of the Internal Circumflex; it passes transversely outwards, through the outer side of the triangular cavity that is before the hip joint, and it is crossed perpendicularly by the descending fasciculi of the Anterior Crural nerve; then gets behind the loose muscles, namely, the Sartorius, the Rectus Femoris, and Tensor Vaginæ Femoris, being anterior to the origin of the Crureus, and here it trifurcates into the;—*Ascending Branch*, the smallest and most irregular, which passes upwards and backwards behind the loose muscles already mentioned, and is continued into the anterior part of the Gluteus Minimus, where it inosculates with the deepest division of the Gluteal Artery: the *Transverse branch* which passes transversely outwards behind the loose muscles, and through the upper part of the Vastus Externus muscle (frequently, however, instead of one regular branch, this division is represented by a set of ramifications taking a corresponding course), is in a great measure spent in it, but some of its extremities emerge from its posterior side and inosculate with the lower branches of the Ischiatic: the *Descending branch* which is the largest, appears like the continuation of the artery. It slants downwards and outwards, between the Crureus and Rectus Femoris; then descends more perpendicularly between the anterior and outer part of the Crureus and the anterior edge of the Vastus Externus, and is partially, and in a very gradual manner, remitted to each;—its diminished continuation enters into the Aponeurosis of the Extensors upon the fore-part of the knee-joint, and blends with the ramifications of the articular arteries, under the form of a general net-work like Anastomosis of vessels; also, in an especial manner, by this means with the Arteria Anastomodica Magna from the superficial Femoral, as well as with the Arteria Recurrens from the Anterior Tibial Artery.

The ARTERIA PERFORANS PRIMA, the first Perforating branch: this forms a part of the bifurcation of the Arteria Femoris Profunda, and turns backwards under the inferior edge of the Pectinalis muscle; then over the upper edge of the Triceps Adductor Brevis (or through its insertion); so as to perforate the insertion of the Triceps Adductor Magnus, opposite to the insertion of the Gluteus Maximus; then, radiating into branches upon the posterior surface of the Triceps Adductor Magnus, between that and the upper part of the long head of the Biceps, it inosculates with the termination of the Ischiatic and the two Circumflex Arteries, and is dispersed to the last mentioned and other contiguous muscles.

The ARTERIA PERFORANS SECUNDA, the second perforating branch, is the other part of the bifurcation of the trunk, is the largest of the two branches, and descends in the same direction as the trunk, and therefore seems to be its continuation; it inclines behind the upper edge of the Triceps Adductor Longus, and becomes first concealed by that; then beneath the lower edge of the Triceps Adductor Brevis; next perforating the insertion of the Triceps Adductor Magnus opposite the origin of the short head of Biceps Flexor Crurus, it gets to the back of the thigh, where it is dispersed in branches to the Adductor Magnus and loose Ham-string muscles, the leading ramifications entering the substance of the short head of the Biceps, and in that, inosculating with the Arteria Perforans Externa vel Prima, from the Popliteal Artery. There are frequently other Perforating branches, making a Perforans Tertia, Quarta, and even after that an Ultima; but the precise course, as well as the number of these additional ones, is uncertain—they all, however, perforate the Triceps Adductor Femoris, and so pass to the back of the thigh, supplying the portions of the last muscle, and the Ham-string muscles.

ARTERIA POPLITEA.

The Popliteal Artery is the superficial Femoral, descending through the Ham to the back of the Leg. It begins, as the superficial Femoral Artery, in the upper part of the Ham, where the superficial Femoral Artery *perforates the tendon of the Triceps Adductor Magnus, and emerges from the termination of the Tricipital Canal of the thigh.* It descends through the Ham, opposed to the Fossa Poplitea of the Os Femoris, and *bounded laterally* by the Ham-string tendons, and still lower by the Condyles of the Os Femoris; being deeply buried in the fat of the Ham, and distantly covered (along with concomitant organs), by the continuation of the Fascia Lata Femoris, stretching across the Ham, between the two sets of Ham-string tendons. It subsequently descends posteriorly to the knee-joint, in correspondence with the Ligamentum Popliteum, and then upon the surface of the Popliteus muscle; being crossed obliquely and very closely (along with its concomitant organs) by the Plantaris muscle, and *bounded laterally* by the two heads of the Gastrocnemius; then becoming covered by the coalescence of the two heads of the Gastrocnemius muscle, immersed also in the origin of the Tibial portion of the Soleus, and being precisely in correspondence with the inferior margin of the Popliteus muscle, it bifurcates into the posterior and anterior Tibial Arteries.

The *Concomitant Organs* are as follow:—The *Popliteal Vein*, which is situated closely behind the artery; its whole length is closely invested with that, in one very strong sheath of dense cellular membrane, and is also in firm cohesion with the back of the artery, by a septum of the sheath formed by a continuation of its cellular substance. The *Popliteal*, or (perhaps more properly speaking, the beginning of) the *Posterior Tibial Nerve*, is situated at a little distance behind the Vein, or more superficially and nearer the surface of the Ham; so that some of the Fat intercepts it from the Vein and its sheath, and another portion of the Fat from the Fascia Lata Femoris; interspersed in the Fat around these organs, there are about half a dozen Lymphatic Glands, which are smaller than those in the Axilla or Groin, called the Popliteal Lymphatic Glands. As the Popliteal Artery and Vein descend on the Popliteus muscle, they gradually get out of the Fat of the Ham, and the artery, vein, and nerve come contiguous.

The nominal Branches from the Popliteal Artery, are the nine which follow:—

The first two branches are, the ARTERIA PERFORANS EXTERNA et INTERNA. These are given off from the commencement of the Popliteal Artery, and frequently even when it is immersed in the insertion of the Triceps Adductor Magnus muscle. The Arteria Perforans Externa passes outwards, and supplies the lower part of the Biceps Flexor Cruris (i. e. the External Ham-string muscle), and the contiguous part of the Vastus Externus; but for the most part enters into the substance of the short head of the Biceps, in which it distinctly inosculates with the second perforating branch of the Arteria Femoralis Profunda; by this inosculation a continued line of artery is established, in the short head of the Biceps muscle, between the termination of the Arteria Femoralis Profunda, and the commencement of the Popliteal Artery.

The ARTERIA PERFORANS INTERNA passes inwards, and is usually totally dispersed to the Internal Ham-string muscles: sometimes a slender, unexpended, and meandering portion of it descends behind the Internal Condyle, then along the Internal Spine of the Tibia concomitantly with the Nervus Saphenus, and the Vena Saphena Major; and supplying these, ends on the Malleolus Internus in an inosculation with the Internal Malleolar branch from the Anterior Tibial Artery.

As the artery descends deeply through the Fat of the Ham, it sends off small ramifications, promiscuously, to the Fat and Lymphatic Glands. When the artery gets behind the knee-joint, it gives off the branches which follow next.

The ARTERIA ARTICULARIS INTERNA SUPERIOR arises from the inner side of the Popliteal Artery behind the knee-joint, and bends upwards and inwards, in a semicircular manner, round the inner side of the Os Femoris immediately above the Internal Condyle, close upon the bone, so as to pass beneath the Internal Ham-string tendons, subsequently the tendon of the Triceps Adductor Magnus, and the lower part of the Vastus Internus; it is then continued, in a diminished size, into the tendinous expansion of the last named muscle, and ends on the fore part of the knee joint, in the net-work of vessels situated there; inosculating in that with the other articular arteries from the Popliteal, the Anastomodic branch from the Superficial Femoral, and the Recurrent branch from the anterior Tibial.

The Arteria Articularis Externa Superior arises from the outer side of the Popliteal Artery opposite the last, and arches upwards and outwards round the external side of the Os Femoris, just above the External Condyle, close upon the bone, consequently behind, first, the tendon of the Biceps, and then the lower part of the Vastus Externus; it is continued downwards and forwards into the expansion of that muscle, and branching in the united expansions of the Extensor muscles upon the fore-part of the joint, terminates in the net-work of vessels formed there, by the anastomosis of this and the other arteries already mentioned.

The Arteria Articularis Azygos, a small branch arising from the anterior side of the Popliteal Artery, which perforates the back of the Capsule, frequently also the Popliteal Ligament, or enters between the Popliteal Ligament and Popliteus muscle, to be dispersed to the parts within the cavity of the joint; *viz.* the Synovial structures, Fat, Internal Ligaments and Cartilages.

The ARTERIA ARTICULARIS INTERNA INFERIOR arises from the inner side of the Popliteal Artery, a little lower down than the Interna Superior: it slants downwards and inwards closely round the internal and inferior part of the head of the Tibia; consequently beneath the internal head of the Gastrocnemius muscle, then beneath the lower termination of the Internal Lateral Ligament and the expanded insertions of the Internal Hamstring tendons; then bending forwards, and rather upwards, meets the others in the general anastomosis on the front of the joint.

The ARTERIA ARTICULARIS EXTERNA INFERIOR arises from the outer side of the Popliteal Artery, a little below the External Superior Articular and turns transversely outwards round the outer side of the joint, being upon the Capsule where it is connected to the outer edge of the External Semilunar Cartilage; so as to pass first beneath the belly of the Plataris and the outer head of the Gastrocnemius, then to be between the External Semilunar Cartilage and the External Lateral Ligament along with the tendon of Biceps; it is then continued fowards and ends in the net-work.—This net-work is situated in the Aponeurosis covering the front of the joint formed by the united insertions of the Exterior muscles of the leg, so as to surround the Patella, and in some degree (like the Aponeurosis itself) to extend over this Patella:

more than this, large branches are inflected from each of the Articular Arteries in this anastomosing net-work, which help to supply the inside of the joint.

From the same part as the lower Articular, the Popliteal Artery gives off the two ARTERIÆ SURALES, which descend into the two heads of the Gastrocnemius muscle, are continued through the two heads, then the two bellies, of the Gastrocnemius, being gradually expended in them, and lost just above the commencement of the tendon of the muscle.

A little lower, the Popliteal Artery gives off some large branches, which are anonymous muscular branches, and supply the Soleus muscle. These arise from the Popliteal Artery (as it is beneath the origin of the Soleus muscle, and just as it is about to bifurcate into the Anterior and Posterior Tibial Arteries), and descend through the belly of the Soleus muscle.

ARTERIES OF THE LEG.

ARTERIA TIBIALIS POSTICA.

The Posterior Tibial Artery arises from the bifurcation of the Popliteal Artery, and passes downwards (at first inclining rather inwards), so as to descend deeply through the internal side of the leg; it is first supported upon the part of the Tibialis Posticus muscle, and subsequently, in the two lower thirds of the leg, on the external or Fibular edge of the Flexor Longus Digitorum; being covered by the internal side of the Soleus and the internal belly of the Gastrocnemius muscles. It afterwards becomes uncovered, by these muscles receding to the Tendo Achillis; descends behind the Malleolus Internus inwardly, and the Tendo Achillis and Tuberosity of the Os Calcis more outwardly; having before it, or nearer the Malleolus Internus (in the same hollow), the tendons of the Tibialis Posticus and the Flexor Longus Digitorum, and more outwardly than it, or nearer the Tuberosity of the Os Calcis the tendon of the Flexor Longus Pollicis;—the continuation of the Posterior Tibial nerve (which is situated externally, and rather posteriorly, to the artery during its whole descent), intervenes between the artery and the tendon of the Flexor Longus Pollicis; and all these parts are crossed (as they are in this hollow behind the Malleolus Internus) by the Ligamentum Lancineatum. The artery afterwards descends into the Sinuosity of the Os Calcis, and there bifurcates into the two *Plantar Branches;* these subsequently descend in a diverging direction beneath the Abductor Pollicis into the sole of the foot.

The Internal Plantar Branch is by much the smallest; and the chief part of it passes forwards in promiscuous ramifications within the substance of the Inter-muscular Ligament which unites the bellies of the Abductor Pollicis and the Flexor Brevis Digitorum,—so as to supply the internal side of the muscular substance of the sole formed by the Abductor Pollicis and the internal side of the Flexor Brevis Digitorum; and some of these ramifications are extended still further forwards to supply the internal side of the Great Toe; one leading branch of the Internal Plantar Artery, called the *Arteria Pollicaris,* is not expended in this promiscuous manner, but courses forwards, somewhat more deeply than the promiscuous portion of the artery, by the side of the Flexor Longus Pollicis; and opposite to the space between the roots of the Great and Second Toe bifurcates, supplying the outer side of the Great Toe and the internal side of the Second Toe.

The Arteria Plantaris Externa, the External Plantar branch, is in reality the continuation of the trunk of the artery, and courses forwards and outwards obliquely across the sole of the Foot upon the Flexor Accessorius, and between that and the Flexor Brevis Digitorum; then gets to the external side of the Foot, and in correspondence with the base of the Metatarsal bone of the Little Toe; subsequently bends inwards in an arched form, transversely, across the Metatarsal bones near their bases, under the name of the *External Plantar Arch*, being behind the Flexor tendons and the Lumbrales muscles; and as it gets into the internal side of the Foot, is behind the Adductor Pollicis muscle; ultimately, as it is covered by this muscle, it forms a continued trunk with the Anterior Tibial Artery, in the interosseal space between the bases of the Metatarsal bones of the Great and Second Toes.

The Posterior Tibial Artery gives off the following branches:—

The ARTERIA MAGNA NUTRITIA TIBIA arises from the beginning of the Posterior Tibial Artery, passes downwards and forwards into the Medullary canal of the Tibia, (that is situated about three inches below the edge of the head of the bone,) to be distributed to the substance of the bone. The commencement of the Posterior Tibial Artery also gives off the ARTERIA PERONEA COMMUNIS; this is one of the three large arteries of the Leg, and therefore will be considered subsequently under a separate head.

The Posterior Tibial Artery, as it descends through the Leg, gives off promiscuous muscular branches, by which it adheres to the contiguous muscles.

In the lower part of the leg, as the Artery gets near the Malleolus Internus, it gives off the RAMUS TRANSVERSUS, a short Transverse branch passing outwards across the posterior side of the Tibia, and beneath the lower part of the Flexor Longus Pollicis muscle, to unite with the lower part of the Peroneal Artery. As the Artery descends behind the Malleolus Internus, and as it is about to bifurcate, it gives of the ARTERIÆ CALCANEÆ, a set of small branches, which pass backwards in an arborescent form, and become dispersed through the expansion of the Ligamentum Lanciniatum, upon the internal side of the Tuberosity of the Os Calcis.

The Artery then parts into the ARTERIA PLANTARIS INTERNA et EXTERNA, already described. The Internal Plantar Artery frequently gives off the *Arteria Pollicaris*, which has been described.

The External Plantar Artery, when it gets into the outer side of the sole of the Foot, and opposite to the base of the Metatarsal bone of the little Toe, and just before it forms the Arch, gives off the Arteria Plantaris Minimi Digiti Pedis; a small branch, which passes forwards upon the Flexor Brevis Minimi Digiti Pedis, supplies that, and parts immediately contiguous, subsequently passing forwards upon the external side of the little Toe.

The beginning of the Arch gives off the *Arteria Digitalis Tertia*, which courses forwards, first behind the Flexor Tendons and the Lumbricalis muscle belonging to the little and fourth Toe; and then emerges from between the continuations of these as they pass to the Toes just named, and also from behind the Plantar Fascia, so as to bifurcate and supply the inner side of the little Toe, and the outer side of the fourth Toe.

The *Arteria Digitalis Secunda* arises from the middle part of the Plantar Arch posteriorly to the Adductor Pollicis, also the Flexor tendons and Lumbricalis muscle; then emerges from between the continuations of the tendons, passing to the third and fourth Toes, and from behind the portions of the Plantar Fascia corresponding to these two Toes, and so as to come opposite to the interval between the Toes; when it bifurcates, to supply the internal side of the fourth Toe and the external side of the third.

The *Arteria Digitalis Prima* arises from the Arch near its termination, and is at first concealed behind the Adductor Pollicis muscle; it is then concealed behind the Flexor tendons and Lumbricalis muscle of the second and third Toes, emerges from between these, and from behind the corresponding portions of the Plantar Fascia, comes opposed to the internal between the two Toes so as to bifurcate and supply the internal side of the third and the external side of the second. The termination of the Arch, for the sake of distinction, is called the *Arteria Communicans*, and it is in one continued trunk with the termination of the anterior Tibial Artery, between the Metatarsal bones of the first and second Toes. The External Plantar branch supplies nearly all the muscular substance of the deep part of the Sole.

ARTERIA PERONEA COMMUNIS.

The Common Peroneal Artery arises from the upper part of the Posterior Tibial Artery, about an inch below its origin; it passes downwards (and at first inclines a little outwards) upon the upper part of the Tibialis Posticus muscle; then passes between the Tibialis Posticus and the edge of the Flexor Longus Pollicis; afterwards descends nearly perpendicularly, covered by the belly of the Flexor Longus Pollicis, along the posterior surface of the Fibula, being immersed in the origin of the last-mentioned muscle; it subsequently sinks between the lower parts of the Tibia Fibula; and just as it is above the articulation of these bones, and closely behind the lowest part of the Interosseal Ligament, it bifurcates into the *Anterior* and *Posterior branch.*

The *Anterior Branch* passes forwards through the lowest part of the Interosseal Ligament, closely above the articulation, then, descending upon the anterior side of the articulation, it is partially spent upon the Malleolus Externus, and inosculates there with the External Malleolar Branch from the Anterior Tibial Artery; the unexpended part subsequently passing forwards upon the Tarsus, inosculates there with the Arteria Tarsea from the Anterior Tibial Artery.

The *Posterior Branch* descends behind the

Malleolus Externus, with the Peroneal Tendons, and is lost upon the outer side of the Tarsal part of the Foot; inosculating towards the Dorsum of the Foot with the termination of the Tarseal branch from the Anterior Tibial Artery, and towards the Sole with ramifications of the external Plantar Branch from the Posterior Tibial.

Independently of muscular branches given off from the Peroneal Artery in its course, also a Nutritial Branch to the Fibula, and the two of its bifurcation just described, it is united just above its bifurcation with the lower part of the Posterior Tibial Artery, by the transverse branch already mentioned in the description of the Posterior Tibial Artery.

This artery, by its distribution, forms an intermedium, or medium of connection, to the two Tibial Arteries; for its branches anastomose with each—it is to these just what the Interosseal is to the Radial and Ulnar Arteries in the Fore-arm.

ARTERIA TIBIALIS ANTICA.

The Anterior Tibial Artery arises from the bifurcation of the Popliteal, and passes forwards through the Interosseal opening above the Interosseal Ligament, and through the united heads of the Tibialis Anticus and Posticus muscles: it then descends upon the middle of the Interosseal Ligament, in the superior third of the Leg, being between the Tibialis Anticus and Extensor Longus Digitorum; in the two inferior thirds it is between the Tibialis Anticus and the Extensor Proprius Pollicis, till it comes upon the lower extremity of the Tibia, and is overlapped by the belly of the Extensor Proprius Pollicis; it then passes beneath the Ligamentum Tarsi Annulare Anticum, and is fairly crossed by the tendon of the Extensor Proprius Pollicis; subsequently advances forwards over the internal side of the Dorsum of the Foot, externally to the tendon of the Extensor Proprius Pollicis, being on the Astragatus Os Naviculare and the articulation between the Os Cuneiforme Internum and Medium; it, lastly, turns downwards into the sole of the Foot, between the bases of the Metatarsal Bones of the first and second Toes—to form a continuous trunk with the External Plantar arch of the Posterior Tibial Artery; by which the two Tibial Arteries are one at their commencement, and one at their termination.

The Venæ Satellites of the Artery are two, and ascend by its sides; and the Anterior Branch of the Peroneal Nerve descends in front of the Artery, sometimes within, and at other times upon the Sheath.

The Branches given off from the Anterior Tibial Artery are the following:—

The Arteria Recurrens, which arises from the upper part of the Anterior Tibial Artery as soon as it gains the front of the Leg, and passes upwards, through the origin of the Tibialis Anticus muscle, or between the origin of the Tibialis Anticus and the Extensor Longus Digitorum; so as to be continued upwards, into the tendinous expansion of the Extensor muscles, upon the forepart of the knee-joint, where it ends by blending with the net-work of the Articular Arteries. Thus this net-work of Anastomoses is formed, by the Arteria Anastomodica Magna from the superficial Femoral Artery; by the descending portion of the External Circumflex Artery from the Deep Femoral; by the four Circumflex Articular Arteries from the Popliteal; and by the Recurrent branch of the Anterior Tibial. The Anterior Tibial Artery, in its descent upon the Interosseal Ligament, gives small muscular branches to the Tibialis Anticus, Extensor Longus Digitorum, and Extensor Proprius Pollicis, which pass into those muscles, nearly transversely.

At the lower part of the Leg, and just above the ancle joint, the artery gives off the two Malleolar branches.

The ARTERIA MALLEOLARIS INTERNA passes inwards and downwards behind the tendon of the Tibialis Antica, to be distributed on the Malleolus Internus.

The ARTERIA MALLEOLARIS EXTERNA passes outwards and downwards, behind the tendons of the Extensor Proprius Pollicis, the Extensor Longus Digitorum, and the Peroneus Tertins, to be distributed on the Malleolus Externus, where it inosculates with the anterior branch of the Peroneal Artery.

When the Anterior Tibial Artery gets upon the

Tarsus, it gives off the ARTERIA TARSEA; the Tarseal branch passes outwards and forwards obliquely across the Dorsum of the Tarsus, towards the bases of the Metatarsal bone of the little Toe; being beneath the Extensor Brevis Digitorum, and the more superficial tendons of the Extensor Longus Digitorum, and is for the most part spent in the Extensor Brevis.

A little further forwards, the Artery gives off the ARTERIA METATARSEA, the Metatarsal Branch, which passes outwards, and rather forwards, across the Bases of the Metatarsal Bones, beneath the four portions of the Extensor Brevis Digitorum as they are becoming tendinous, as well as the continuation of the tendons of the Extensor Longus Digitorum: it is gradually expended in the *Arteria Interossea*, consisting of three small branches; one passing forwards upon the back of each of the external Intercostal Muscles, between the Metatarsal bones of the four smaller Toes; so as to supply them, and then end in minute ramifications, which, form the vascularity of the expansions of the Extensor tendons upon the backs of the Toes. Just before the Artery turns down through the Interosseal space into the sole, it gives off—

The ARTERIA DORSALIS HALLUCIS, which passes forwards by the back of the Metatarsal bone of the Great Toe, and upon the corresponding Interosseal Muscle, and is spread in ramifications to the expansion on the back of the Great Toe, and also upon the inner side of the back of the second Toe.

The **Arteria Plantaris Profunda** is merely the termination of the Anterior Tibial Artery, plunging into the sole, through the Interosseous space,—to become continuous with the Posterior Tibial Artery.

THE END.

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